

waiting

Minnesota State Medical Meeting, St. Paul, October 10-12, 1923

VOLUME VI

NUMBER 8

# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association  
Northern Minnesota Medical Association and Minneapolis Surgical Society*

## EDITOR

CARL B. DRAKE, M.D., St. Paul

## ASSISTANT EDITORS

STANLEY R. MAXEINER, M.D., Minneapolis

DONALD K. BACON, M. D., St. Paul

## ASSOCIATE EDITORS

### First District

GEO. S. WATTAM, M.D., Warren

### Third District

E. L. TUOHY, M.D., Duluth

### Fifth District

GEO. B. WEISER, M.D., New Ulm

### Second District

F. H. KNICKERBOCKER, M.D., Staples

### Fourth District

F. L. ADAIR, M.D., Minneapolis

### Sixth District

F. M. MANSON, M.D., Worthington

### Seventh District

H. B. AITKENS, M.D., Le Sueur Center

### Eighth District

F. P. STRATHERN, M.D., St. Peter

AUGUST 1923

## CONTENTS

### ORIGINAL ARTICLES:

- CHARLES G. SUTHERLAND, M.D. (Tor.), Rochester—Unusual Findings in Roentgenography of the Head..... 473
- JAMES A. JOHNSON, M.D., F.A.C.S., Minneapolis—Meckel's Diverticulum as an Etiological Factor in Intestinal Obstruction; Report of Three Cases..... 479
- THOMAS ZISKIN, M.D., Minneapolis—Functional Tests in Heart Disease..... 484
- STANLEY R. MAXEINER, M.D., and REUBEN H. WALDSCHMIDT, A.B., B.S., M.B., M.D., Minneapolis—Tuberculosis of the Epididymis..... 492
- J. A. MYERS, Ph.D., M.D., Minneapolis—Tuberculosis in School Children: Its Diagnosis, Classification and Treatment..... 497
- A. M. SNELL, M.D., Mankato—Hypothyroidism..... 503
- C. C. KENNEDY, M.D., Minneapolis—Surgical Relief of Dysmenorrhea..... 507

(Continued on Advertising Page III)

Owned and Published Monthly by

## THE MINNESOTA STATE MEDICAL ASSOCIATION

### BUSINESS MANAGER

J. R. BRUCE, 402 Guardian Life Bldg., Saint Paul

Telephone: N.W. Cedar 1683

210 Commercial Bldg., Minneapolis

Telephone: Atlantic 2716

Entered at the Post Office in Saint Paul as second class mail matter.

Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

Subscription Price { \$3.00 yearly, Domestic  
\$3.50 yearly, Foreign

CONTENTS OF THIS PUBLICATION PROTECTED BY COPYRIGHT

# California

**A**s the oldest established Bond House on the Pacific Coast, our experience in California has been such that you will no doubt find interesting our booklet

## *"California Securities"*

We will be glad to send a copy of this publication to any investor upon request.

*Ask for Booklet No. J22*

## E. H. Rollins & Sons

BOSTON  
200 Devonshire St.

NEW YORK  
43 Exchange Pl.

PHILADELPHIA  
1421 Chestnut St.

CHICAGO  
111 W. Jackson St.

SAN FRANCISCO  
300 Montgomery St.

DENVER  
315 International Tr. Bldg.

LOS ANGELES  
203 Security Bldg.

# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association  
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VI

AUGUST, 1923

No. 8

## ORIGINAL ARTICLES

### UNUSUAL FINDINGS IN ROENTGENOGRAPHY OF THE HEAD\*

CHARLES G. SUTHERLAND, M.B. (Tor.)  
Associate in Roentgenology, Mayo Clinic  
Rochester, Minnesota

#### FOREIGN BODIES IN THE FACE AND SKULL

In 1921 I reported two cases of splinters of glass in the face and skull, and since that report we have had a third case.

#### REPORT OF CASES

*Case 1* (A352100), a man, aged forty-five years, a vaudeville artist, came to the Clinic complaining of a chronic inflammatory condition of the right side of the face, difficulty in opening the mouth, and pain on movement of the jaw. About four weeks before, after a long period of intermittent hot applications, a discharge of bloody pus appeared at a point 2 cm. above, and just anterior to the external ear. The patient could feel a sharp point in the opening of the sinus. He had been in an automobile accident thirteen months before, and was thrown against the windshield, his head passing through the glass. Freed from his position, he was taken to an emergency hospital, where sixteen stitches were required to close a wound in the right external ear just posterior to the tragus. The wound healed by first intention, and the stitches were removed by a physician in another city, who examined the patient and made a diagnosis of fracture of the bones of the face. Five weeks later he commenced to have severe pain, some swelling of the tissues of the face, and difficulty in opening the mouth. He suffered almost continually thereafter, and consulted physicians in various cities, all of whom diagnosed fractures of the bones of the face or skull; but none had roentgen examinations made. He was forced to cancel several vaudeville engagements because of disability from pain and swelling of the face. Examination at the Clinic revealed a discharging sinus above, and just anterior to the right external ear; a sharp corner of what was taken to be glass protruded from the mouth of the sinus.

The roentgenogram revealed a triangular, opaque shadow 8 cm. along the sides and 3.5 cm. across the base, the base running from the glenoid fossa upward and backward parallel with the outline of the pinna, and the apex reaching to a point 1 cm. above, and 0.5 cm. behind the external angular

process of the eye. The patient was admitted to the hospital and the glass removed under local anesthesia. The glass was 4 mm. thick. Complete relief followed.

*Case 2* (A248010), a man, aged thirty years, had been in an automobile collision one month before coming to the Clinic. A splinter of glass had been driven through the skull. The fragment entered at the inner margin of the right orbit, and apparently passed through the middle line and lodged against the occipital bone. Splinters of glass were removed from the right eye on the eleventh day after the accident, and from the right cheek on the thirteenth day. At about this time an unsuccessful attempt was made to locate and remove the fragment of glass in the brain. The patient was brought to the Clinic in a semicomatose state, with a moderate degree of paralysis of the right arm and leg, ptosis of the right eye, impairment of vision and disturbance of motion.

Roentgenograms revealed a splinter of glass in the posterior portion of the skull, which in the anteroposterior view appeared to be in the middle line. The patient's condition was such that further surgical intervention offered no prospect of improvement, and he was taken to his home. Word was received of his death within a fortnight.

*Case 3* (A374381), a man, aged forty years, was in an automobile accident four months before coming to the Clinic. A splinter of glass from the windshield penetrated his face, and lodged in the right zygomatic fossa. Roentgenogram (Fig. 1) revealed the splinter in dislocation. The patient came for an operation for appendicitis. Removal of the splinter was advised at this time, but not urged; the patient decided against removal.



Fig. 1 (Case A374381). Lateral roentgenogram showing splinter of glass in the right zygomatic region.

\*Read before the Minnesota Neurological Society, May 12, 1923.



Fig. 2 (Case A404519). Sella turcica showing erosion of the floor thirty-seven days after accident and nine days after definite clinical evidence of abscess of the brain and increased intracranial pressure.

*Case 4* (A404519), a boy, aged thirteen years, accidentally shot himself with a 22-caliber rifle, the bullet entering the left canine fossa. On admission to the hospital one week later, he was apathetic, and showed some rigidity of the muscles of the neck. The cerebrospinal fluid was slightly yellow in color, the pressure was +2, with a cell count of 29 lymphocytes. The leukocyte count was 8,000. The patient recovered sufficiently to be taken home one week later, but was readmitted after two weeks, because of occasional headaches, vomiting, diplopia, fever, and slight rigidity of the muscles of the neck. At this time examination revealed bilateral choked discs, positive Kernig sign, and a cerebrospinal fluid cell count of 160 small lymphocytes, 80 large lymphocytes and 340 polynuclears. The leukocyte count was 8,000. The headaches increased in intensity, the leukocyte count rose to 71,600, the tem-

perature to 103, and he died nine days after the second admission.

Necropsy showed that the bullet had entered at the left canine fossa, perforated the anterior portion of the right cribriform plate of the ethmoid, severed the right olfactory nerve, and lodged within the cerebral cortex, just beneath the dura in the coronal plane about 1 cm. to the right of the medial border of the right cerebral hemisphere. Within the right frontal lobe, and just anterior to the lateral sinus was an abscess cavity (5 cm. in diameter) containing about 50 c.c. of pus. The abscess had ruptured into the lateral ventricle, in which pus was found. There was also pus in the fourth ventricle. In the floor of the sella turcica commencing erosion was evident (Fig. 2).

Roentgenograms made immediately prior to necropsy (Figs. 3 and 4) revealed evidence of increased intracranial pressure, but none of abscess. A roentgenogram of the brain after removal showed a small circumscribed cavity at the location of the bullet, and another cavity on the lateral aspect of the frontal lobe, the latter having ruptured and emptied with the removal of the dura.

#### OXYCEPHALY

Oxycephaly has three cardinal features: (1) gradually progressing impairment of vision, (2) exophthalmos, and (3) characteristic cranial deformity. The cause is given as a premature synostosis, usually in the sagittal suture, sometimes in the coronary, temporosphenoidal or parieto-sphenoidal, and less often in the lambdoidal and parieto-occipital sutures. Many hypotheses have been advanced as to the cause of the synostosis, but time will not permit a discussion of these. Fletcher has described three distinct groups of oxycephaly: (1) congenital, with the exophthal-



Fig. 3 (Case A404519). Lateral roentgenogram, showing bullet in brain with evidence of increased intracranial pressure.

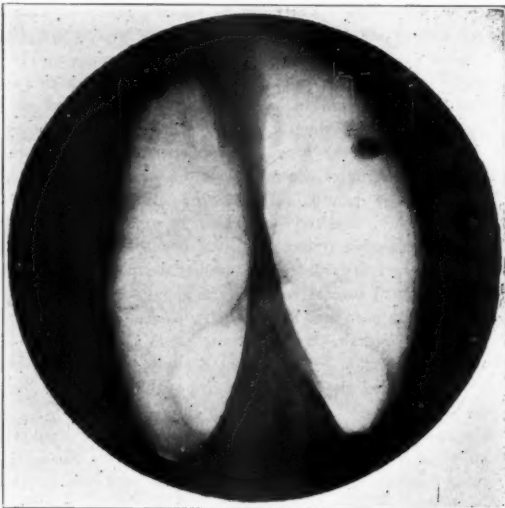


Fig. 4 (Case A404519). Roentgenogram of the brain, showing abscess at the location of the foreign body and a lateral abscess which had ruptured and emptied with the removal of the dura.

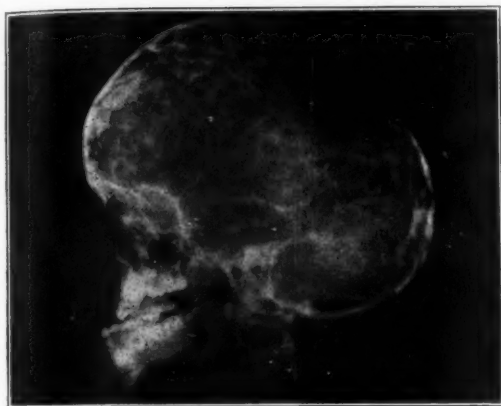


Fig. 5 (Case A380861). Lateral roentgenogram of an oxycephalic head.

mos and cranial deformity present at birth, (2) change in the shape of the head developing in the first few months of life, and (3) a condition in which the patient is normal for the first few years, and the earliest abnormal signs appear between the second and sixth years. In the collected cases in the literature, the incidence has been largely in the male; in the four cases in the Mayo Clinic series, it is divided equally. The impairment of vision is usually noted between the second and sixth years. The blindness is due to a postneuritic atrophy. Exophthalmos, owing to shortening of the orbital cavities by the pushing forward of the greater wings of the sphenoid to form their posterior in place of their lateral walls, is seen in more than 50 per cent of cases. It is often greater on one side than on the other. The lid symptoms of exophthalmic goiter are not seen. Strabismus, commonly divergent, but occasionally convergent, is present in the majority of cases. Nystagmus is frequent and the mobility of the globes is often limited.

Roentgenograms (Figs. 5 and 6) reveal a characteristic cranial deformity, the forehead and anterior portion of the skull being unusually high. The increased height is usually in the frontal region, but it may be in the parietal. A projection corresponds to the sagittal suture, and the apex is just posterior to the anterior fontanel. The parietal bones drop abruptly to the normal level, and there may be a hollow on each side of the crest. The cranium is always wide in proportion to the length; the cranial cavity may be almost spherical; the vault is pointed; the two halves of the skull are

usually symmetrical, but striking exceptions have been reported. Thickening or depressions along the line of the sutures may be seen, and obliteration of the superciliary ridges and prognathism are often noted. Flattening of the malars, often unilateral, is common. The contour of the bone is thinned, and over the vault are seen putty-finger impressions due to an atrophy of the inner table, and attributed to pressure by the convolutions. The suture lines are usually not seen. There may be an associated hyperostosis, either between the impressions, or in other parts of the skull, as in the ethmoid or in the sphenoid. The vessel markings are often widened and the vessel foramina enlarged. The frontal eminences are obliterated in the majority of cases, as are also the frontal and mastoid sinuses. The sella turcica may be exceptionally well delineated; it is often enlarged and displaced backward. The base of the skull shows important changes; the fossæ are usually deep and wide, the posterior fossæ forming, in some cases, as much as two-thirds of the base. The middle fossæ may be deepened, reaching in some cases a level as low as that of the posterior. The temporal regions are pushed outward, so that the temporal fossæ may be shallow or obliterated.



Fig. 6 (Case A380861). Antero-posterior roentgenogram of an oxycephalic head.

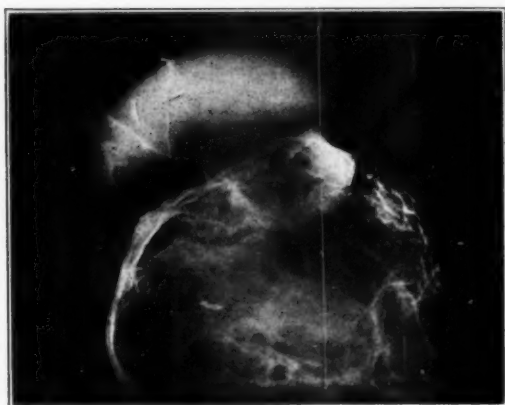


Fig. 7 (Case A259660). Lateral roentgenogram illustrating the spontaneous decompression sometimes seen in oxycephaly.

#### REPORT OF CASES

Case 5 (A380861), a boy, aged five years, had had a prominent forehead and exophthalmos since birth. When he commenced to walk, it was noticed that he was partially blind. He was the fourth child, and, while labor had been difficult, instruments had not been used. He had been breast-fed, and, except for slight difficulty in breathing, had developed normally. Three sisters and two brothers were normal. One uncle was known to have prominent eyes and strabismus.

This is one of a series of four cases of oxycephaly that I reported in 1922.

Case 6 (A259660), a boy, aged five years, illustrates (Fig. 7) the spontaneous decompression sometimes seen in oxycephalics, either in the parietal bones, where they may be large and symmetrical, or in the roof of the orbits. His deformity had been present since birth; the mass was first



Fig. 8 (Case A371150). Lateral roentgenogram of a case of oxycephaly larvée.

noticed nine months before coming to the Clinic, and had gradually increased in size. The strands of ossifying bone noted by Watts in one case, two years after he had made a decompression, are well depicted in this case.

Case 7 (A371150), a boy, aged ten years (Fig. 8), is an example of a type described by Bertolotti as *oxycephaly larvée*, in which changes in the skull are not so marked, but those of the orbits and base are diagnostic. The mother and one brother of this child showed moderate grades of a similar type of oxycephaly.

A striking feature, clinically, is that, although many of these patients have an idiotic appearance, the intelligence is unimpaired. The palate may be shortened and highly arched; cleft palate, anterior and posterior, has been noted, but is infrequent. Headache, and occasionally convulsions, may occur in the active stage of the disease.

Case 8 (A272457), a male infant, aged two months and ten days, was brought to the Clinic with a history of intermittent attacks of crying, usually at night, with a backward



Fig. 9 (Case A272457). Photograph of a baby, aged two months and ten days, with anencephalic head.

thrust of the head suggesting pain. They had developed in the latter two weeks. The child was well developed and overweight (Fig. 9), quiet throughout the day, and, except during the attacks, slept well. Roentgenograms (Fig. 10) revealed the flattening of the vault with the upward projection of the occipital bone. The diagnosis was made of *anencephalus*, and the child was taken home.

#### ACROMEGALY WITH SARCOMA OF THE PITUITARY.

##### REPORT OF CASE

Case 9 (A253290), a man, aged twenty-eight years, a native of Sweden, came to the Clinic, complaining of overgrowth of the bones, particularly of the head and face, quite rapid for the first year, and gradually progressive since. He was normal up to the age of twenty, and the overgrowth had become noticeable in the last six years, appearing first in the hands and lower jaw. About six years before examination, his left eye had suddenly become almost blind; there was slight improvement after two months, but since that time gradual decrease of vision. Examination of the eye revealed a bitemporal hemianopsia. The neurological diagnosis was acromegaly, and operation was advised for possible conservation or restoration of vision. A two-stage operation was performed, and a large tumor (weight 15

gm.) solid to the touch, and about 2 cm. in diameter, was found bulging between the optic peduncles and the commissure. On account of the size of the tumor, the capsule was opened, and a curette used to evacuate the contents. The pathologic diagnosis was sarcoma. Following the second operation the patient was up, about the hospital, and ready to be dismissed, when he developed a suppurative frontal sinusitis, and subsequently an encephalitis that resulted in a marked edema, thrombosis of the vessels of the brain, and death.

Necropsy revealed enormous development of the body frame and the body structures. The height was six feet four inches, and the weight 278 pounds. The feet and hands were twice the normal size. The skull was of tissue-paper thinness. The sella turcica measured 4 cm. transversely and anteroposteriorly, the walls were very thin, and there was erosion of the posterior clinoid processes.

A roentgenogram (Fig. 11) showed marked overdevelopment of the bones of the skull and face, with marked prognathism, thinning of the bone, and enormous frontal sinuses. The sella turcica was very large, and there was marked thinning of the posterior clinoid processes.

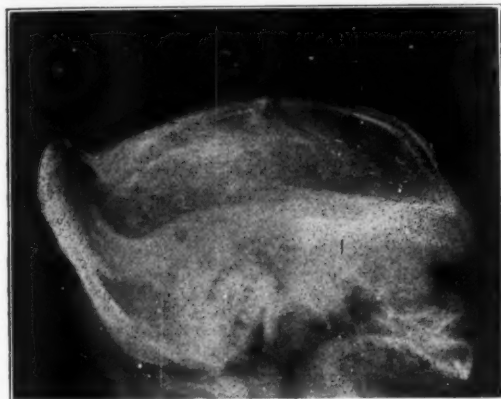


Fig. 10 (Case A272457). Lateral roentgenogram of an anencephalic head.

#### ENDOTHELIO-PSAMMOMA OF THE FRONTAL BONE.

##### REPORT OF CASE

Case 10 (A384300), a man, aged fifty-nine years, came to the Clinic, complaining of convulsions. For twenty-five years, following a severe blow on the head, he had suffered from nocturnal attacks of which he himself was not conscious. These were three or four years apart at first, and gradually increased in frequency until two years ago, when they occurred at weekly intervals. Since then the convulsions have been less frequent, and have been replaced by transient losses of consciousness, lasting from two to ten minutes, and gradually increasing in frequency. Memory for recent events had been poor, and the patient became incapacitated for his work three months before. The neurologic findings were blurring of the discs, especially the left; slightly irregular pupils; exaggerated deep reflexes, and slight to moderate inco-ordination with generalized tremor. Roentgenograms (Fig. 12) revealed a large osteoma in the left frontal region. At operation an endo-



Fig. 11 (Case A253290). Lateral roentgenogram of an acromegalic head. This patient was operated on and the pathologic diagnosis was sarcoma of the pituitary.

thelio-psammoma (7x7x6 cm.) was removed from the left frontal lobe. The tumor arose from the dura just above the frontal sinus on the left side, and had eroded the bone. The patient recovered well from the operation, and was up and around the hospital when he suddenly developed an increased temperature, had a convulsion, and died within twenty-four hours.

Necropsy revealed internal hydrocephalus, and an acute septic cerebrospinal meningitis following craniotomy, and removal of endothelioma of the left frontal lobe.

#### OSTEOSARCOMA, INVOLVING BOTH ORBITAL CAVITIES.

##### REPORT OF CASES

Case 11 (A327297), a man, aged twenty-one years, came to the Clinic complaining of protrusion of both eyes. Five years before, he had been struck over the left eye with a baseball. Three months later he was examined elsewhere; at this time the left eye was protruding half an inch, and was still covered by the paralyzed lid; a fracture could be felt passing backward and outward across the roof of the orbit, and a hard mass was palpated half an inch back of the orbital ridge, and an inch from the nose. Operation



Fig. 12 (Case A384300). Lateral roentgenogram showing an endotheliopsammoma of the frontal bone.

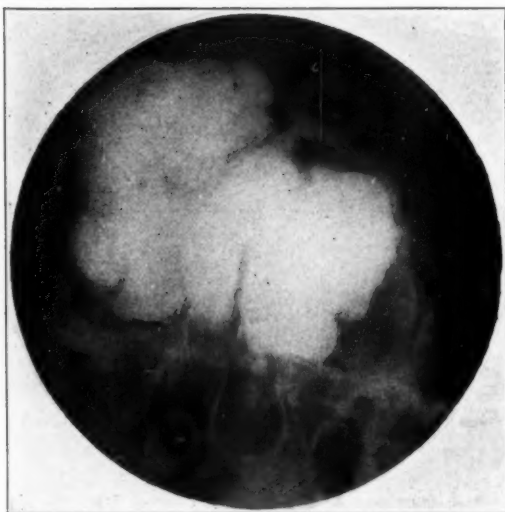


Fig. 13 (Case A327297). Roentgenogram showing an osteosarcoma involving both orbital cavities.

elsewhere revealed a fracture of the anterior wall of the frontal sinus, with an extensive osteosarcoma behind, which was removed. Within a year there was evidence of recurrence in the left orbit, and in the right frontal sinus. Two months before examination at the Clinic, an acute infection developed in the right orbit, and has been draining since. The patient had an ulcer on the right cornea. Roentgenograms (Fig. 13) showed areas of increased density over both orbital regions. A diagnosis was made of osteosarcoma and radium treatment was advised.

Case 12 (A394202), a man, aged thirty-four years, came to the Clinic, complaining of swelling of the right frontal and temporal regions, with pain over the right eye, and exophthalmos. For thirty-two years the right occipital and frontal region had been prominent. Eight months before, a minute swelling (about 1 cm.) appeared in the middle of the supraorbital ridge and extended medially. Exophthalmos appeared six months before, with a depression of the



Fig. 14 (Case A394202). Lateral roentgenogram revealing an osteosarcoma of the right frontal bone and an osteoma of the occipital bone.

eyeball, accompanied by a feeling of tension in the eye. At about this time, vision in the right eye became impaired. Six weeks before, intermittent, burning, stinging pain commenced over the right eye. The occipital prominence was noted on examination here. The only finding of import in the examination of the eye was a complete proptosis of the right eye from the orbit. The neurologic examination was essentially negative. A roentgenogram (Fig. 14) revealed a large tumor involving the whole occipital bone, with little increase in density, and a tumor of greater density, involving the frontal area. A diagnosis of osteosarcoma of the right frontal bone was made and the patient returned to his home. Word was received six months later of his death, and no post-mortem examination was made.

Case 13 (A315208), a girl, aged fourteen years, came to the Clinic, complaining of a tumor of the left occipitoparietal region of two years' duration. Two years before, she had fallen on the ice and struck the back of her head. Nine months before, she first noticed a small pimple at the site of the tumor. This gradually increased in size until it reached a diameter of from 2 to 3 cm. Two months before,



Fig. 15 (Case A315208). Lateral roentgenogram illustrating a sarcoma of the left parietal bone eroding the bone, evidence of increased intracranial pressure, and a large hernia of the cerebrum.

an operation had been performed elsewhere, on which no data were available. Neurologic examination showed a general weakness of all muscles on both sides of the body. Examination of the eye disclosed a condition resembling a contracted field rather than true hemianopsia; when an object was held to the right side of the patient, the left eye could not see it until the object was brought almost directly in front. A roentgenogram (Fig. 15) showed evidence of increased intracranial pressure, with a large hernia of the cerebrum from the parieto-occipital area. A diagnosis was made of sarcoma of the left parietal bone with erosion and hernia of the cerebrum. The patient was dismissed with the suggestion that Coley's serum be used in the hope of delaying the progress of the tumor.

#### BIBLIOGRAPHY

- Sutherland, C. G.: Splinters of glass in the face and skull revealed by the roentgen ray. *Jour. Am. Med. Assn.*, 1921, lxxvi, 1749.  
Sutherland, C. G.: Oxycephaly. *Jour. Radiol.*, 1922, iii, 465.

# MECKEL'S DIVERTICULUM AS AN ETIOLOGICAL FACTOR IN INTESTINAL OBSTRUCTION: REPORT OF THREE CASES\*

JAMES A. JOHNSON, M.D., F.A.C.S.

Assistant Professor of Surgery,  
University of Minnesota Medical School  
Minneapolis

Early in embryonic development the digestive tract is formed by an infolding of the yolk sac. The connecting canal which the embryonic intestine has with the yolk sac is termed the omphalomesenteric or vitelline duct. This duct is accompanied by an artery and two veins which maintain the circulation between the yolk sac and intestinal tract. When the embryo is about five weeks old the duct has no further function and normally disappears. The vessels simultaneously disappear. The vein later becomes the portal vein, while the artery becomes the superior mesenteric artery. When an entirely normal development exists at birth, all traces of both duct and vessels have disappeared.

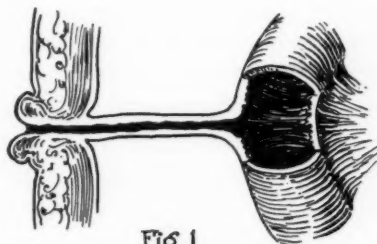


Fig. 1  
Patent omphalomesenteric duct

In about 2 per cent of all persons some form of remnant of this duct remains. Its vessels likewise may persist as a fibrous cord, usually attached to the end of the remaining duct. The persistence of these embryonic structures in one form or another may give rise to interesting phenomena, depending upon the structure remaining:

1. If the omphalomesenteric duct is patent throughout (Fig. 1), feces and gas may escape at the umbilicus at birth or when the cord drops off, or a fistula may later develop.

2. If the canal is obliterated and a portion of the mucosa or a remnant of the duct persists at the

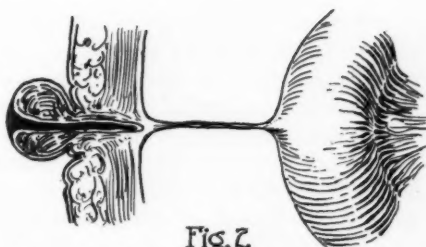


Fig. 2  
Remnant of omphalomesenteric duct  
at umbilicus

navel, a mucous polyp may be evident with a protruding red nodule of mucosa discharging a mucous material. There may be only a small remnant of mucosa at the navel or it may persist for a varying distance (Fig. 2). This is not at all an uncommon condition. Two such cases were observed at the University Dispensary in 1918.

3. The duct may be closed at both the umbilical and intestinal ends and patent in its mid-portion, in which instance a cyst may develop (Fig. 3). These cases are rare.

4. When the duct remains patent at the intestinal end, it is commonly known as Meckel's Diverticulum (Fig. 4). This is the most common form of remnant of the omphalomesenteric duct and is present in about 2 per cent of all persons.<sup>1</sup>

In 1812 Meckel first accurately described its embryologic origin and the diseases to which it was subject. Its presence, however, had been described many years previous.

Meckel's diverticulum is usually found in the lower ileum from 1 to 3 feet from the ileo-cecal junction. It has a great variety of sizes and shapes and its distal end is often attached to the abdominal wall at the umbilicus, either by a remnant of its obliterated portion or by the obliterated omphalo-

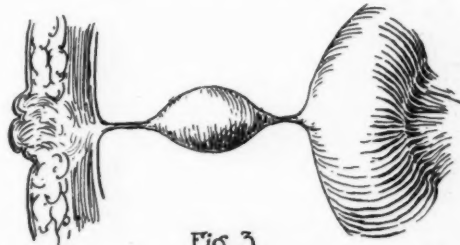


Fig. 3  
Omphalomesenteric duct closed at both ends;  
patent in mid-portion

\*Presented before the Southern Minnesota Medical Association, Mankato, December, 1922, and the Minneapolis Surgical Society, December 7, 1922.

mesenteric vessels. It is usually attached to the bowel directly opposite the mesentry but is not infrequently attached near the mesenteric border and may itself have a leaf of mesentry (Fig. 5). Not infrequently remnants of the omphalomesenteric vessels extend out over its tip and are attached to the umbilical region (Fig. 6). For some unknown reason, Meckel's diverticulum is present three times as often in males as in females.

Considering the fact that Meckel's diverticulum is present on an average of about 2 per cent of all persons, it is probably not especially liable to cause trouble. I believe it is a general impression with the profession that it is of rare occurrence. However, in a review of the literature on this subject, the reports are numerous. Undoubtedly, there are several times as many cases that have never been reported.

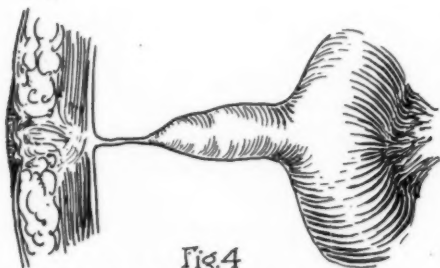


Fig. 4  
Meckel's diverticulum; duct patent at intestinal end and attached to umbilicus by a fibrous remnant of outer portion

In general, it may be subject to any of the diseases common to the intestinal tract. A diverticulitis occurs in much the same manner as an appendicitis, for which it is usually mistaken in diagnosis. A great variety of foreign bodies have been found pocketed in it and not infrequently give rise to inflammation and perforation. However, by far the most common disturbance is *intestinal obstruction*.

There are a great variety of ways in which this may be brought about:

1. When the diverticulum is attached to the abdominal wall, it may by its traction cause an angulation at its junction with the intestine, or the intestine, being suspended in this way, may rotate on a fixed point, causing a volvulus, or a loop of free bowel may twist itself about the cord attached to the diverticulum.

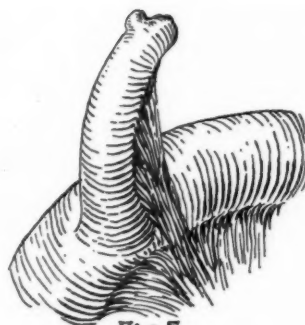


Fig. 5  
Meckel's diverticulum; attachment at mesenteric border and mesodiverticulum  
(Dr. James A. Johnson's Case II)

2. When there is a long diverticulum or a cord is attached to its tip floating free in the abdomen, it may become adherent to another loop of bowel or to the mesentery or omentum, thus forming a band underneath which a portion of the bowel becomes strangulated. The diverticulum or cord attached to its tip not infrequently knots itself about a loop of bowel almost as accurately as if it had been carefully tied. The free end of the diverticulum may become adherent in a hernial sac.

3. A diverticulum becomes invaginated into the bowel, causing an intussusception.

4. A diverticulitis or congenital stricture may obstruct the lumen.

It is difficult to ascertain just what percentage of intestinal obstruction is due to Meckel's diverticulum. Halstead<sup>2</sup> estimates that in 991 cases of intestinal obstruction collected by various authors 6 per cent were caused by this remnant, while Griffith<sup>3</sup> cites Barnard's 669 cases of obstruction by bands, occurring in the London Hospital during

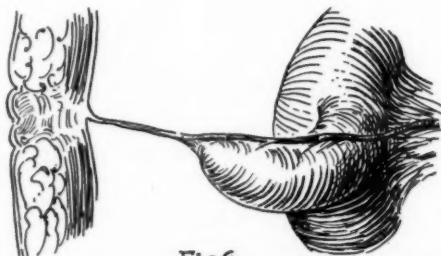


Fig. 6  
Remnant of omphalomesenteric vessel

thirteen years, in which only 3.14 per cent were due to the diverticulum.

The most common form of obstruction is brought about by a constricting band of the diverticulum and its cord. Wellington,<sup>4</sup> collecting 326 cases of Meckel's diverticulum, found that 144 were obstructed in this manner, 59 by intussusception and 9 by volvulus. Porter<sup>5</sup> collected 184 cases, 101 of which were obstructed by bands, 20 by intussusception and 8 by volvulus.

The classical manner in which an intussusception occurs is by an invagination of the diverticulum into the lumen of the bowel. This is then caught in the peristaltic wave and the bowel becomes invaginated at the attachment of the diverticulum.

The diverticulum may find its way into a hernial sac and become adherent, causing an angulation or twisting of the bowel, which results in an obstruction. Wellington<sup>4</sup> reports twenty-seven cases in which it was found as part of the hernial contents, in many instances causing strangulations. Porter<sup>5</sup> reports twenty-one such cases in which the diverticulum was the cause for immediate operation in all but one.

When the diverticulum is patent throughout its entire length, it occasionally happens that the bowel prolapses through the opening at the navel, causing a strangulation. Porter<sup>5</sup> reports two such cases in his collection of 184 diverticuli.

There may be a congenital stricture of the ileum at the site of attachment of the diverticulum. Such a case is reported by Cheyne.<sup>6</sup> A diverticulitis with suppuration has formed adherent loops of bowel, producing obstruction.

It is natural to suppose that these mechanical interferences would occur at an early age. However, in 184 cases of all types of obstruction due to Meckel's diverticulum, Porter<sup>5</sup> gives the average age as twenty-one years, two months. Wellington<sup>4</sup> found in a collected series of 59 cases of intussusception by the diverticulum that only 10 per cent occurred during the first two years, and that the average age was fourteen years. It may occur at any age, the range being seven days to eighty years.

The symptom complex corresponds to that found in any mechanical obstruction. In reviewing numerous case reports it was often noted that the initial pain was located at the umbilicus. This is probably present in many of those cases in which the diverticulum is attached to the inner abdominal wall at this point.

The diagnosis of Meckel's diverticulum is rarely, if ever, made before operation. Other congenital malformations or the history of a discharging umbilicus may give a clue.

The mortality from obstruction by Meckel's diverticulum is high, ranging from about 60 to 70 per cent in various groups of cases collected. Porter<sup>5</sup> reports 60 per cent; Halstead,<sup>2</sup> 68.1 per cent; Berard and Delore,<sup>7</sup> 72.3 per cent. It is very apparent in most cases that the high mortality is due to lack of early diagnosis and immediate surgical interference. Meckel's diverticulum is said to have greater potential danger than the appendix. It should therefore be removed if found during the course of abdominal operations.

From this review, it would seem that intestinal obstruction due to Meckel's diverticulum is not at all of uncommon occurrence and frequent enough to warrant the surgeon's keeping constantly on guard.

It is with this in view that I report the following cases:

*Case 1.*—Master M. D. Male, age 12 years, schoolboy. Previous history negative except for scalp wound three years previous.

*Previous Complaint:* On July 9, 1916, at 9 A. M., he was suddenly seized with abdominal cramps and vomited several times. This all disappeared after an anodyne and at 3 P. M. he was up and about. July 19th, shortly after eating his supper, he began to complain of abdominal cramps. He was kept awake all night with severe cramps and repeated vomiting; repeated cathartics and enemas were given without result. The following day he began to improve and July 22nd he was up and about. On the morning of July 23rd, he went to the kitchen for his breakfast and was suddenly seized with a pain in the region of the umbilicus. This was so sudden and so severe that he fainted. The pain continued and he began to vomit. I was called in consultation at 5 P. M. by Dr. S. V. Hodge. On examination, the abdomen was very distended and he was vomiting bile; pulse 120; temperature 99.2. A diagnosis of intestinal obstruction was made and he was at once removed to the hospital.

*Operation:* On opening the abdomen, a Meckel's diverticulum was found about 18 inches from the ileo-cecal junction. The tip of this and a fibrous band had become adherent to the root of the mesentery just above the promontory of the sacrum. A loop of small bowel had passed under this and had become obstructed (Fig. 7). Because of the critical condition of the patient, the diverticulum was not removed but inverted into the bowel and closed with a purse-string suture.

*Post-operative:* The pulse could not be counted when he left the operating room; for three days it remained 160 to 170. On the third day the bowel contents were syphoned off and he rapidly improved and had an uneventful recovery.

**Case 2.**—No. 19413. Male, aged 64, admitted to the University Hospital July 15, 1920, with right inguinal strangulated hernia.

**Previous History:** Right inguinal hernia since childhood. Pneumonia forty years ago. Operation for appendicitis five years ago.

**Present Illness** began the morning of July 13, 1920, at which time he noticed that his hernia had become much larger. It soon began to pain. The pain became severe and he vomited twice. He had a large normal stool during the day. This pain continued and July 14th he was unable to produce a stool. He was able to walk into the hospital.

**Examination** revealed a large scrotal hernia on the right side which could not be reduced. Temperature 98.6; pulse 95; W.B.C. 5,000. Urine showed trace of albumin. Immediate operation was advised.

**On operation** under local anesthesia, about two feet of ileum were found dilated and adherent to the sac by fibrous exudate. The bowel was delivered into the wound. A Meckel's diverticulum was found firmly adherent to the bottom of the sac and covered with exudate as if inflamed (Fig. 8). It was about 2.5 inches long and located about 20 inches from the ileo-cecal junction. It arose somewhat from the lateral aspect of the bowel and had an individual mesentery. Its diameter was nearly that of a normal ileum.

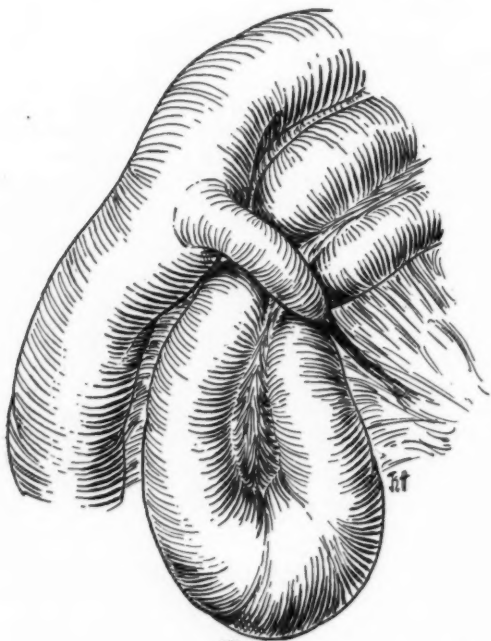


Fig. 7

Tip of Meckel's diverticulum with obliterated cord attached to root of mesentery; loop of small bowel strangulated underneath.

(Dr. James A. Johnson's Case I)

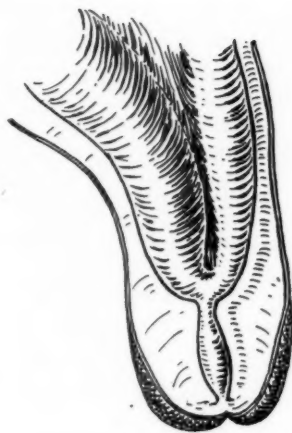


Fig. 8

Meckel's diverticulum adherent to sac of inguinal hernia causing angulation of ileum with obstruction.

(Dr. James A. Johnson's Case II)

The tip was rounded and contained no fibrous band. The diverticulum was removed and the stump inverted into the bowel. A Bassini hernia repair was done. The patient had an uneventful recovery. The pathological report was "acute diverticulitis."

The diverticulum had evidently become adherent to the bottom of the hernial sac during its inflammatory attack and in this way caused an angulation of the bowel, producing an obstruction.

**Case 3.**—No. 5040. Male, age 8 months, well nourished and always in good health.

**Present Complaint:** On the morning of October 31, 1921, he awoke at 6 A. M., fretful and very restless. At 7 A. M. he was suddenly seized with abdominal pain. He doubled up, was wet with perspiration and very pale. He did not seem to be in great distress but vomited all food taken during the day. There was fair result from an enema that evening. He was removed to the hospital and the following day I saw him in consultation with Dr. Rood Taylor and Dr. Martin Ott. The child had been fretful during the night, but had slept at intervals. Temperature 100; W.B.C. 14,000. No vomiting. Nothing had been given by mouth. There had been no stools and no evidence of blood from bowel. The abdomen was moderately distended. There was no palpable mass. Fluoroscopic examination of the chest was negative. No mass could be visualized in the abdomen by x-ray. During the afternoon while he was asleep, a palpable mass could be made out in the right abdomen. A diagnosis of intussusception was made and operation was advised.

**Operation:** On opening the abdomen, a large intussusception was found in lower ileum. The bowel was hopeless-

ly gangrenous and a resection was made with an end-to-side anastomosis of the ileum to the cecum. On examination of the specimen (Fig. 10), a Meckel's diverticulum was found about 20 inches from the ileo-cecal valve. A long fibrous band was attached to its tip. This band had become adherent to the bowel below the attachment of the diverticulum. The lowest point of intussusception was at the attachment of this band to the bowel. It is therefore probable that the band had been pulled in during a peristaltic wave and started an infolding which pulled the diverticulum in (Fig. 9).

The child died during the night.

In a fairly careful search of the literature, I fail to find a similar case.

Intussusception due to Meckel's diverticulum is relatively uncommon. Only thirteen cases are reported in the literature in the ten years, 1911-1921. The classical way in which it occurs is by an invagination into the lumen of the bowel; the peristaltic wave attempting to force it onward invaginates the portion of the bowel to which it is attached.

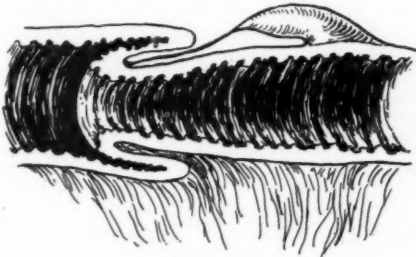
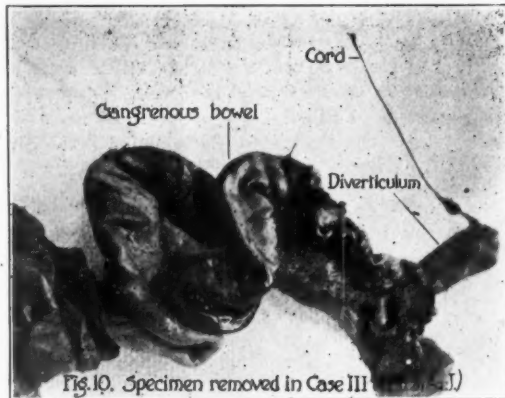


Fig. 9

Band from Meckel's diverticulum adherent to ileum - band and diverticulum being drawn in by peristaltic wave, causing intussusception and obstruction (Dr. James A. Johnson's Case III)

#### CONCLUSIONS

1. Meckel's diverticulum is present in about 2 per cent of all persons.
2. It is probably an etiologic factor in over 2 per cent of all mechanical obstructions.
3. The average age at which obstruction occurs is twenty-one years and two months, although it may occur at any age, the range being seven days to eighty years.
4. Symptoms are those of any mechanical obstruction.
5. It has a greater potential danger than the



appendix and should be removed if found during the course of abdominal operations.

6. It is one of the important causes of intestinal obstruction and occurs frequently enough to warrant the surgeon keeping constantly on guard.

#### BIBLIOGRAPHY

1. Committee of the Anatomical Society of Great Britain and Ireland: *Jour. Anat. & Phys.*, 1891-1892, xxvi, 675.
2. Halstead: *Am. Surg.*, 1902, xxxv, 471.
3. Griffith: *Jour. Am. Med. Assn.*, 1914, ixii, 1624-1628.
4. Wellington: *Surg. Gyn. & Obst.*, 1913, xv, 74.
5. Porter: *Jour. Am. Med. Assn.*, Sept. 23, 1905, 883.
6. Cheyne: *Am. Surg.*, 1904, xi, 796.
7. Berard & Delore (cited by Halstead, *Amer. Surg.*, 1902, xxxv, 471).

#### DISCUSSION

DR. HARRY P. RITCHIE, St. Paul: This is no place to recite cases, but I am sure that you will support me in the statement that a pre-operative diagnosis of Meckel's diverticulum is very rare. The symptoms are usually those of intestinal obstruction, or so often, as Doctor Johnson has said, of appendicitis. The mortality and seriousness it seems to me in many of these cases has been the result of overlooking the true situation. If it is an intestinal obstruction and we find that (and we must look for it and find it), it presents the same problem that any ordinary intestinal obstruction does. But the thing that impresses me is that the cause is overlooked. We have an idea that it is an acute appendix, we make an exploration, remove the appendix and overlook the diverticulum. I can remember two or three patients who had secondary operations when the Meckel's diverticulum was found and the situation was too late for relief. I think the demonstration of the embryology gives us a lead in the surgery of this condition. When we do not find in the appendix sufficient pathology to satisfy ourselves in a given case further investigation should be made. These diverticuli may be anywhere up to the stomach. If we make it a rule in these cases in which no inflammation of the appendix has been found to examine the distal 18 inches of the ileum I am sure we will find some of these cases that are occasionally overlooked.

Dr. A. R. COLVIN, St. Paul: Doctor Johnson has had certainly a very unusual experience in this question of Meckel's diverticulum. When Meckel's diverticulum causes as high as five or six per cent of all cases of intestinal obstruction we can understand how timely Doctor Johnson's paper is. As further illustrating the dignity of the subject I was very much interested in the fact that Doctor Cullen of Baltimore a few years ago wrote a book of seven hundred pages on diseases of the umbilicus, and of course most of these diseases of the umbilicus are due to errors of development in that region. The errors of development as Doctor Johnson has shown us may consist of any lack of development, failure of closure, etc.

One of the points that I think is very important and which may make the percentage of intestinal obstruction due to vitelline remnants even greater is that some of the cases of intestinal obstruction that we cannot account for may be due to a band running from either the umbilicus or bowel and which may later become adherent to any part of the intestinal canal. Treves in his very valuable article on intestinal obstruction calls attention to this fact. The yolk sac from which Meckel's diverticulum springs or is a remnant, it is interesting to note, is really an extra-fetal structure and the vitelline duct really grows into the fetus and this explains, I think, the reason that in some cases, although Meckel's diverticulum usually originates anywhere from 1 to 3 feet from the ileo-cecal valve as a usual thing, still it may originate anywhere from the ileo-cecal valve to the stomach. Cullen quotes the fact that histologically stomach structures have been found in some of these maldevelopments. The symptoms, of course, as Doctor Johnson has said, are those of any obstruction. An early diagnosis of intestinal obstruction is very difficult. Once having realized or suspected intestinal obstruction I am more and more impressed with the necessity for repeated observation. The saying that "One has to almost live with these patients in order to make up one's mind quickly enough that intestinal obstruction is present," is very true. Once having diagnosed intestinal obstruction and operated for it, then, of course, the value of such a paper as the Doctor's is apparent, because of the different pathology due to Meckel's diverticuli or to the errors in development about the umbilicus. One cannot intelligently deal with the obstruction unless one has this embryologic foundation. It may have some bearing, too, or some influence on the operative procedure. If 5 or 6 per cent of all cases of obstruction are due to Meckel's diverticulum, and if the appendix is the cause of a great many others, then in the very large number of all cases it will be important to approach the region of greatest probability and that is the right iliac fossa, and so the incision had better be made in unknown cases in the right iliac fossa, because one can tell at once by inspection of the cecum whether the obstruction is in the small bowel. These Meckel's diverticuli cases will usually be small bowel obstructions, and consequently in the majority of instances have a rather violent onset.

As to whether or not Meckel's diverticulum should be removed whenever found it seems to me that the condition of the diverticulum should be taken into some account. There would not be any doubt at all in the presence of

pathology or if there were any bands or strings attached, or any holes in the mesentery, as that is another cause of obstruction. The intestine may get caught in the hole in the mesentery; but if, as is so often the case, the diverticulum is represented by a mere teat-like projection as it were, quite widely open into the intestine, then I should doubt the advisability, or necessity rather, of its removal.

Dr. J. A. JOHNSON (closing): I wish to make just one more comment about the last case. This child did not appear to be very sick until a short time before the operation. He had ceased to vomit. There was never evidence of blood in the stool. His abdomen was repeatedly palpated by four different men and no mass could be made out. While he was asleep, a careful palpation first revealed the mass.

It is so important to make an early diagnosis in intussusception that after this when there is any doubt I shall feel justified in giving the patient a whiff of ether to relax the abdomen enough to definitely rule out this condition. If intussusception has progressed to the point where resection becomes necessary, it means a very high mortality.

## FUNCTIONAL TESTS IN HEART DISEASE\*

THOMAS ZISKIN, M.D.

Instructor in Medicine, University of Minnesota  
Consulting Cardiologist, Lymanhurst School for  
Tuberculous Children

Minneapolis

The abandonment of the theory of back-pressure as a cause of cardiac decompensation and the realization that the condition of the heart muscle is the most important index of its efficiency has stimulated many a worker to devise a test, or combination of tests, which would determine the functional capacity of the heart. Numerous methods have been suggested, but none has proved satisfactory, and the problem remains as great today as it was in the past.

It is my purpose to review briefly some of the tests which have been devised, and to record my experiences with the exercise tolerance test, commonly known as the Barringer test.

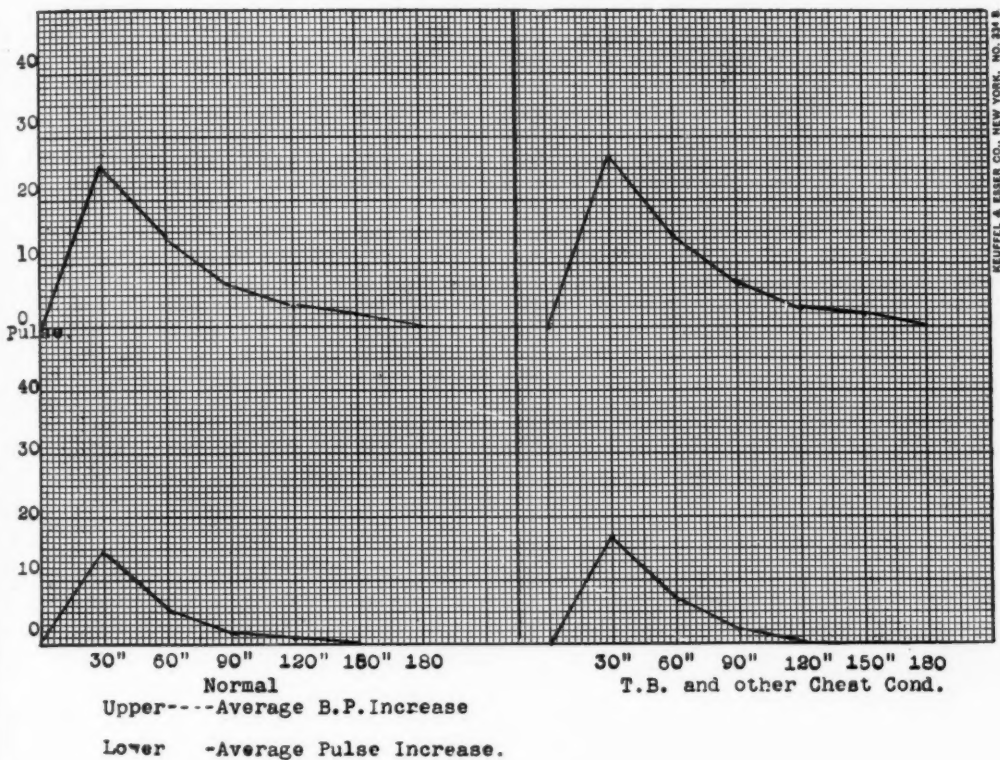
Four fundamental factors must be taken into consideration in any study of the adequacy of the circulation. These are: the cardiac motive power; the vasomotor system; the nervous system; and the condition of the other organs of the body. These factors are variable in character and closely related

\*Read before the Consulting Medical Staff of the Lymanhurst School for Tuberculous Children, January 23, 1923.

to each other. A disturbance of function in any one of them will affect the efficiency of the circulation. Cardiac decompensation is a result of the impairment of the efficiency of the heart muscle itself, and is not caused by anatomical changes that have taken place in the heart valves. It is true that valvular lesions indirectly aid in producing decompensation, but only after the efficiency of the heart muscle has been impaired by the infectious process. As evidence of this, Barringer<sup>1</sup> cites a series of 154 cases of chronic heart disease and shows that 117 cases showed a fever of varying degree, running a course of from three days to many weeks, and that

mining its functional capacity. A heart that is markedly enlarged and dilated will have a much smaller reserve force than a heart that is slightly enlarged or normal in size. The effect of exercise on the size of the heart has also been studied by means of six-foot x-ray plates, taken before and after exercise, but so far, no definite information has been obtained by this method.

The electrocardiograph is of some aid in determining functional capacity, but only in cases which show delayed conduction time, arborization and branch block and complete block. It helps to differentiate these conditions from the simpler myo-



sixty-nine patients showed an increase above normal of the polymorphonuclear leucocytes.

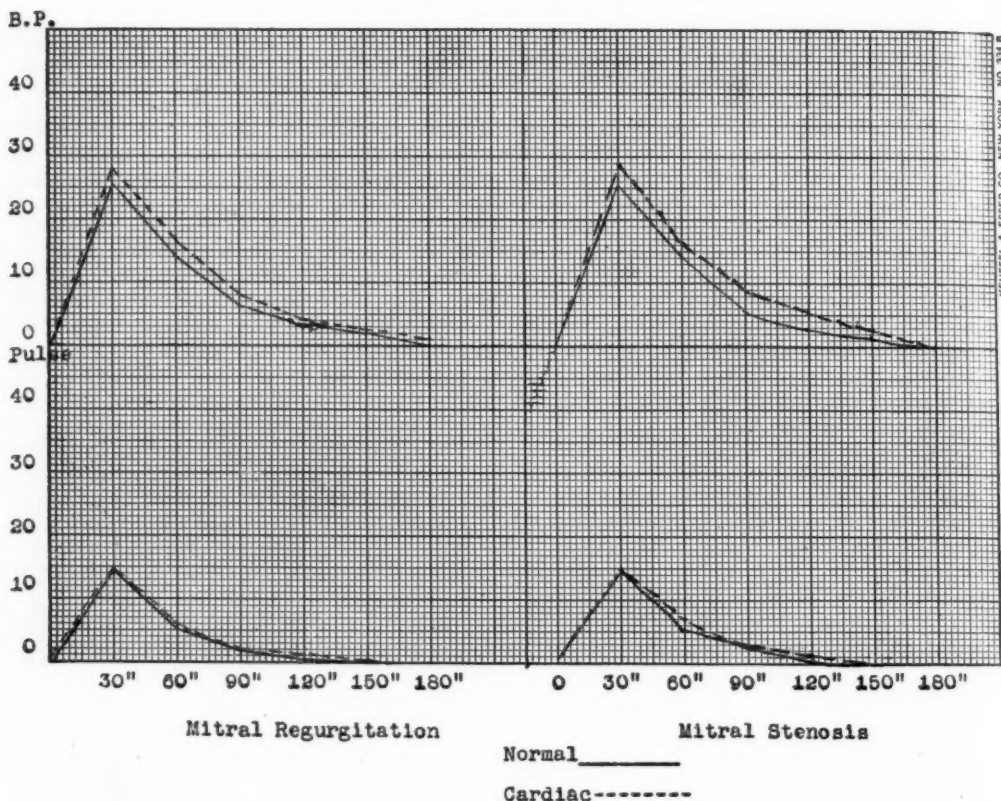
The various tests to be described may be classed into diagnostic tests, respiratory tests and exercise tests.

The *diagnostic tests* include the roentgen ray and electrocardiographic examinations.

The size of the heart, as revealed by roentgenogram or fluoroscopic examination, aids us in deter-

cardial conditions and in this way aids us in determining the functional efficiency of the heart muscle.

*Respiratory Tests.*—Of the *respiratory tests*, only two will be mentioned. Stengel, Wolfarth and Jonas<sup>2</sup> have experimented with the breathing of air of lowered oxygen tension as a test for circulatory function. The apparatus used was very complicated and the results unsatisfactory. They conclude that the test is of little value. The determination



of the vital capacity has been used very much of found that of the eighty patients who did not show late as a means of estimating cardiac efficiency. Peabody<sup>3</sup> and others claim that there is a close relationship between the clinical condition of cardiac decompensation and the vital capacity of the lungs. They state that patients with a vital capacity of 70-90 per cent of normal become short of breath on unusual exertion. If the vital capacity is reduced to from 40-70 per cent, the patient is very much limited in his activities and becomes dyspneic on slight exertion. If the vital capacity is below 40 per cent the patient is usually decompensated and confined to bed. These observers also claim that the vital capacity is of value in prognosis, saying that it rises as the patient improves, and falls as the decompensation increases. Brittingham and White<sup>4</sup> have used the test routinely in all medical ward cases at the Massachusetts General Hospital. They have reported a series of 144 patients, forty-eight of whom had some cardiac complication, sixteen some pulmonary involvement, and eighty no

pathological condition in the heart and lungs. They any cardiac or pulmonary disease 50 per cent had a vital capacity 20 per cent or more under normal. In the pulmonary group all had readings which fell below 60 per cent of normal. In the cardiac group, those patients who had no congestive heart failure had normal vital capacities. They found that the test gave them little help in diagnosis or prognosis, as improvement in vital capacity seemed to lag behind clinical improvement, and also that the vital capacity and exercise tolerance tests were markedly at variance in 14 per cent of their cases. The only conclusion that can be drawn from these findings is that the vital capacity is useful because it adds to our knowledge of the condition and accurately measures the amount of dyspnea. But cardiac failure is not always proportional to the amount of dyspnea, therefore the test cannot be relied upon as an accurate means of determining the heart's efficiency.

**Exercise Tests.**—The response of the heart to a definite amount of exercise has been used perhaps

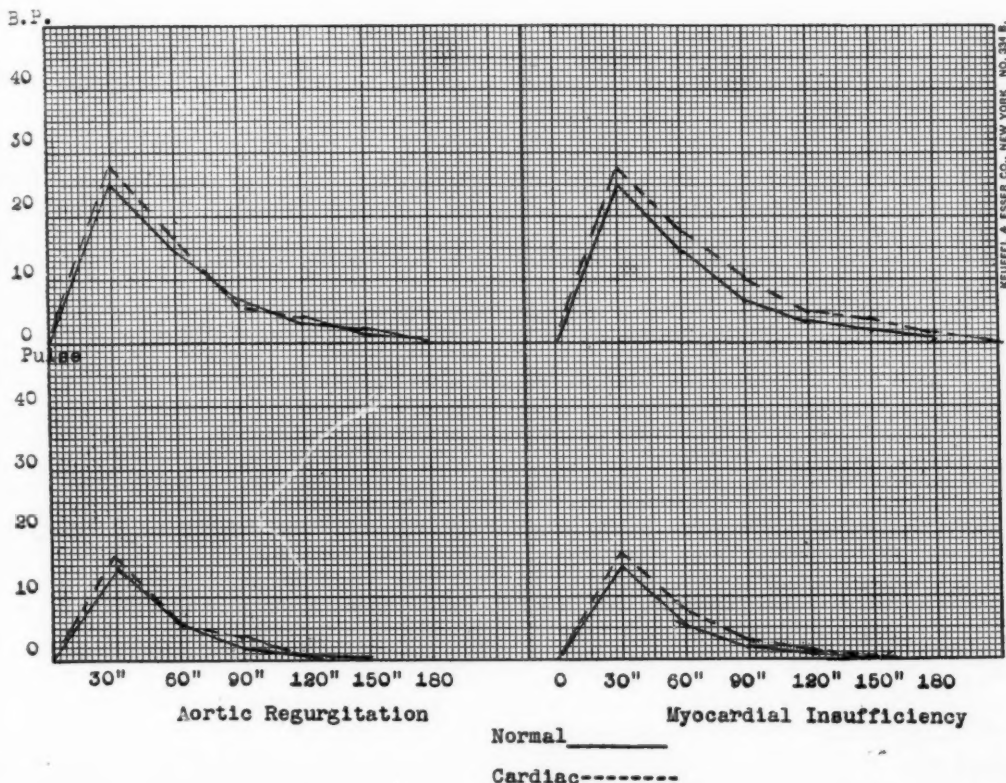
more than any other method in determining its efficiency. Various tests have been devised, such as climbing stairs, hopping, swinging dumb-bells, and doing a measured amount of work on an ergostat. The pulse and blood pressure have been studied during the exercise, and from two to five minutes after the exercise. In this way, attempts have been made to classify patients as to their cardiac efficiency.

The effect of exercise on the pulse rate was perhaps the first method to be studied as to its functional significance. Medelsohn,<sup>5</sup> using an ergostat; Selig,<sup>6</sup> using the stair climbing test; and Kahn,<sup>7</sup> using the hopping test, found that the pulse increases from twenty to twenty-five beats after an exercise of three thousand to five thousand foot pounds and returned to normal within two or three minutes. They assert that the greater the amount of work done with a prompt return to the normal rate the greater is the functional capacity of the heart. Graupner,<sup>8</sup> using an ergometer, made cer-

tain groups perform a definite amount of work and studied the blood pressure during and after the work. He concluded that:

1. If the blood pressure fell, the heart was insufficient for the work.
2. If the blood pressure remained constant, the heart was sufficient for the work.
3. If the blood pressure rose at first and then returned to normal the heart possessed compensatory power.
4. If the blood pressure rose, fell rapidly, and did not again tend to rise, the heart was fatigued.

Katzenstein's<sup>9</sup> method consisted of compression of the iliac arteries for two and one-half to five minutes. The work of the heart was increased by this. He found that in normal hearts there was an increase of 5 to 15 mm. of mercury; in hypertrophied compensated hearts, the blood pressure rose 15 to 40 mm. of mercury; in slightly decomp-

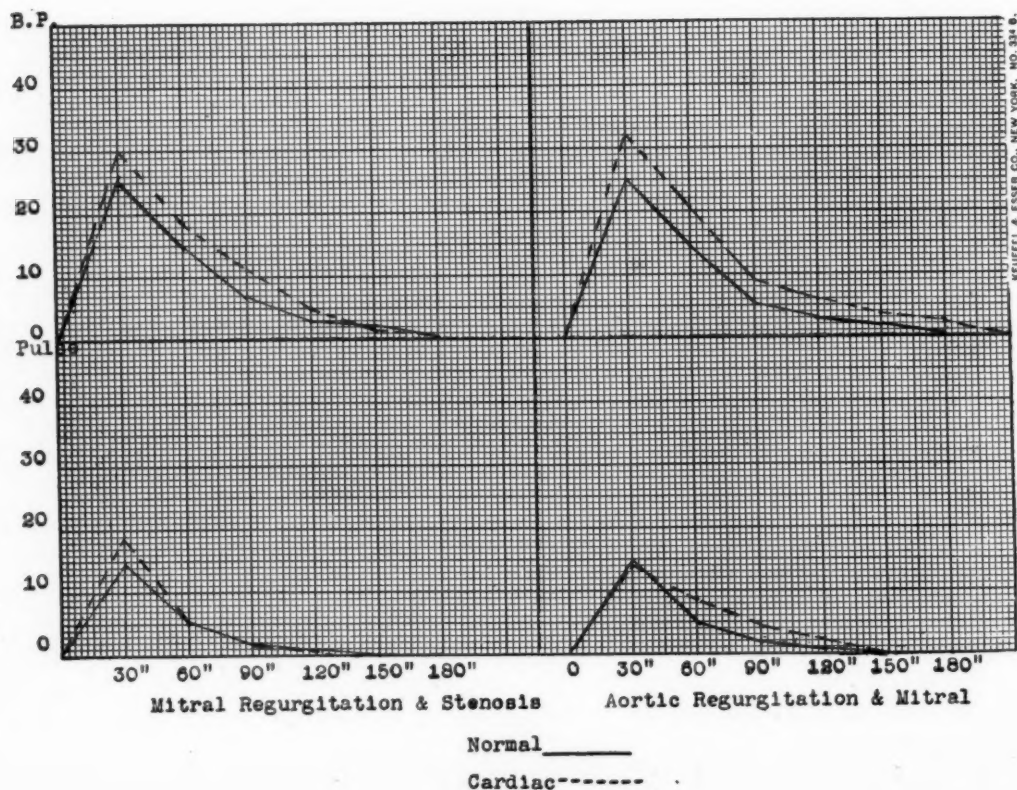


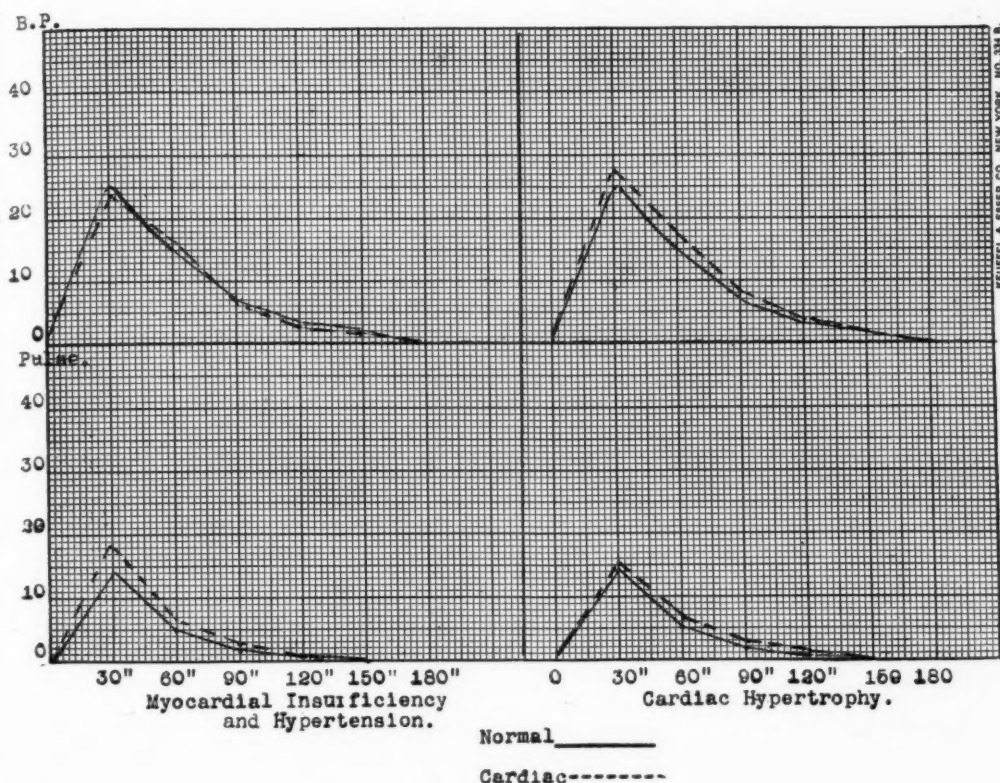
pensated hearts, the blood pressure remained unchanged; and in markedly decompensated hearts, the blood pressure fell and the pulse rate increased. Sahli's<sup>10</sup> method of determining heart function consisted in the use of an instrument known as the sphygmobolometer. With this instrument he would measure the energy of the single pulse waves, and in this way try to determine the heart's efficiency. Schneider,<sup>11</sup> by an association of many of these methods, has tried to establish a scale of cardiac efficiency. He notes the variations in pulse and blood pressure on changing from the reclining to the erect posture and the increase of the blood pressure and pulse after a mild exercise. The exercise consists of stepping on a chair 18 inches high five times in fifteen seconds. He then grades the patient according to the response to each part of the test.

Barringer,<sup>12</sup> using a modification of Graupner's<sup>8</sup> method, studied the blood pressure and pulse after a measured amount of work. His work is based

on the following theory: "Muscular work causes an increased output of the heart and a rise in blood pressure. The rise in blood pressure is caused mainly by the increase of the CO<sub>2</sub> content of the blood. This causes a stimulation of the nerve centers controlling the suprarenal glands, resulting in an increase in the adrenal content of the blood. This causes a constriction of the splanchnic vessels and a rise in blood pressure. Up to a certain limit the blood pressure continues to rise as the work increases. Then it becomes more difficult for the heart to empty itself and an insufficiency occurs. If the work is stopped, then the blood pressure falls and the heart begins to work more efficiently against the lowered pressure and soon again empties itself completely at each stroke and the blood pressure begins to rise again."

Upon this "delayed rise" Barringer<sup>12</sup> bases his test. He shows that a delayed rise is noted whenever the work overtaxes the heart, also that exercise acts upon a damaged heart exactly as it does





on a normal heart. As the reaction occurs only when the heart capacity has been overtaxed, we can see that the sphere of its usefulness is greatly limited.

I have used the test routinely on a group of 678 ex-soldiers referred to me for cardiac examination and treatment. Among these were 276 normals, 332 patients with definite cardiac disease, and 30 patients with pulmonary disease. The exercise consisted of hopping on the toes for one minute at the rate of sixty to ninety times to the minute. The blood pressure and pulse were taken immediately after the exercise and at intervals of thirty seconds for three minutes. A delayed rise was noted in a very few cases. The remainder showed very little variation from the normal. The blood pressure showed a tendency towards a greater increase immediately after exercise in those conditions in which the damage to the heart was greatest.

The pulse showed very little variation in any of the conditions, and usually returned to normal in

one and one-half to two minutes. The figures in the accompanying tables illustrate this clearly. (Tables 1 and 2.) They show, primarily, that a study of the pulse rate after exercise as a test for cardiac efficiency is of very little value; secondarily, that no measured amount of work can be used as an exercise tolerance test in all cases. It is probable that if a greater amount of work was used in this group, a larger number of cases would have shown the characteristic "delayed rise" of Barringer,<sup>12</sup> but the value of the test should be in the differentiation between the normal and the slightly decompensated heart, and here it fails. Therefore no reliance can be placed on the test for diagnostic or prognostic purposes. It may be useful, however, for determining the amount of work that a given patient can do. This test and all the other exercise tests mentioned previously also fail because they cannot control two important factors which greatly affect the results. These are the psychic and nervous influences.

TABLE No. 1

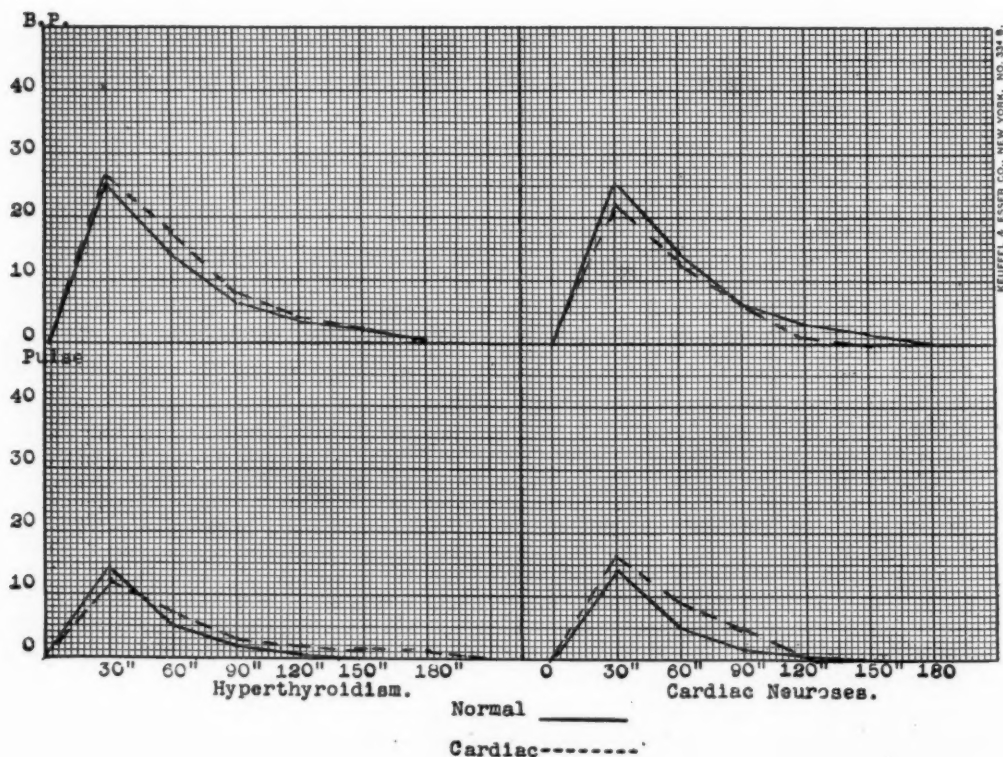
AVERAGE BLOOD PRESSURE INCREASE AFTER EXERCISE

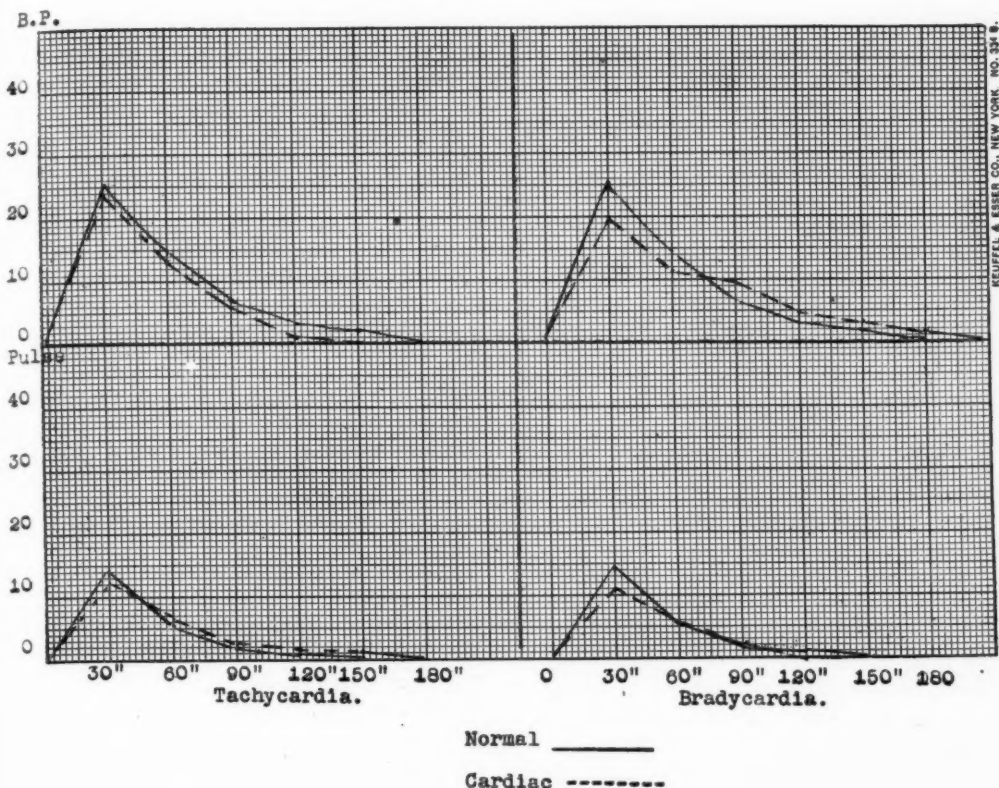
	No.	30	60	90	120	150	180
	Cases	Sec.	Sec.	Sec.	Sec.	Sec.	Sec.
Normal .....	276	25.1	14.3	6.4	3.3	2.08	.26
Mitral Regurgitation	96	28.0	16.8	8.4	4.4	2.5	1.5
Mitral Stenosis.....	37	29.0	16.3	9.0	6.0	3.0	.0
Double Mitral.....	32	30.0	18.7	11.2	5.0	1.3	.5
Aortic and Mitral...	16	32.3	20.7	14.0	6.0	4.0	3.0
Aortic Regurgitation	15	28.0	17.0	6.0	4.0	1.3	.6
Myocardial Insufficiency .....	38	27.5	17.5	10.5	5.7	4.4	1.9
Myocardial Insufficiency and Hypertension .....	25	24.4	16.8	6.8	2.4	1.4	.8
Cardiac Hypertrophy	30	27.7	17.7	8.3	3.7	1.7	.7
Tachycardia .....	12	24.0	13.0	6.0	1.0	.0	.0
Bradycardia .....	6	20.0	11.6	10.0	5.0	3.3	1.6
Hyperthyroidism ...	14	26.4	12.8	7.9	3.9	2.1	.7
Cardiac Neuroses...	13	22.0	13.0	6.1	0.0	0.0	.0
Pulmonary Tuberculosis and Chest Conditions .....	30	27.0	14.6	7.0	3.0	3.0	.0

TABLE No. 2

AVERAGE PULSE RATE INCREASE AFTER EXERCISE

	No.	30	60	90	120	150	180
	Cases	Sec.	Sec.	Sec.	Sec.	Sec.	Sec.
Normal .....	276	14.2	5.38	1.80	0.66	0.24	0.12
Mitral Regurgitation.	96	14.4	6.50	2.80	1.10	0.50	...
Mitral Stenosis .....	37	14.8	7.0	2.4	1.4	0.0	...
Double Mitral .....	32	18.6	5.0	2.4	1.0	0.0	...
Aortic and Mitral..	16	14.0	9.0	5.0	2.8	0.4	0.4
Aortic Regurgitation	15	16.4	6.0	3.4	0.4	0.0	...
Myocardial Insufficiency .....	38	17.3	8.1	3.6	1.5	0.3	0.15
Myocardial Insufficiency and Hypertension .....	25	18.6	6.9	2.6	0.9	0.2	...
Cardiac Hypertrophy	30	15.5	6.8	3.0	1.2	0.4	...
Tachycardia .....	12	12.6	6.6	2.4	1.8	1.2	0.6
Bradycardia .....	6	11.0	6.0	2.0	0.0	0.0	...
Hyperthyroidism ...	14	12.4	7.2	3.0	2.1	1.7	1.7
Cardiac Neuroses....	13	16.2	9.0	5.4	0.6	0.6	...
Pulmonary Tuberculosis and Chest Conditions .....	30	16.6	6.8	2.0	0.3	0.0	...





## SUMMARY

1. Numerous tests have been devised to determine the efficiency of the heart. The majority of them are of little value.

2. The vital capacity and exercise tolerance tests are of some aid in the management of cardiac cases.

3. The only functional test which we have at the present time is the patient himself. A thorough study of the history and symptoms of the case, together with a complete physical examination, will give us more information as to the functional capacity of the heart than all the tests combined.

NOTE: Figures 1 to 7. Curves showing the effect of exercise on blood pressure and pulse rate in various conditions. Exercise consisted in hopping on toes for one minute. Readings taken at intervals of 30 seconds.

## LITERATURE CITED

1. Barringer, T. B.: The etiology of heart failure. *Jour. Am. Med. Assn.*, 1921, lxxvi, p. 1143.
2. Stengel, A., Wolferth, C. C., and Jonas, L.: Breathing of air of lowered oxygen tension as a test of circulatory function. *Am. Jour. Med. Sc.*, 1921, clxi, p. 781.
3. Peabody, F. W.: Vital capacity of the lungs in heart disease. *Arch. Int. Med.*, 1917, xx, p. 433.
4. Brittingham, H. H., and White, P. D.: Cardiac functional tests. *Jour. Am. Med. Assn.*, 1922, lxxix, p. 1901.
5. Mendelsohn, quoted by Kahn, M. H.: Functional diagnosis. 1920, p. 156.
6. Selig.: *Ibid.*
7. Kahn, M. H.: *Ibid.*, p. 158.
8. Graupner, S. C., quoted by Monographic Medicine. 1916, ii, p. 814.
9. Katzenstein, M.: *Ibid.*, p. 817.
10. Sahli, H.: *Ibid.*, p. 817.
11. Schneider, E. C.: Cardio-vascular rating as a measure of physical fatigue and efficiency. *Jour. Am. Med. Assn.*, 1920, lxxiv, p. 1507.
12. Barringer, T. B.: Physical exercise in heart disease. *Am. Jour. Med. Sc.*, 1921, clxii, p. 103.

## TUBERCULOSIS OF THE EPIDIDYMIS\*

STANLEY R. MAXEINER, M.D.

Attending Surgeon, United States Veterans Hospital  
No. 68, and Associate Surgeon, Minneapolis  
General Hospital

Minneapolis

and

REUBEN H. WALDSCHMIDT, A.B., B.S., M.B., M.D.

Resident, United States Veterans Hospital No. 68,  
Minneapolis

The writing of this paper and a review of the literature on this subject was stimulated by the unusual opportunity which I have had of studying a number of cases of tuberculosis of the epididymis, as attending surgeon at the United States Veterans Hospital No. 68, Minneapolis, Minnesota.

A large number of terms are used to distinguish this disease, such as tuberculosis of the epididymis, tuberculosis of the testicle, tuberculosis of the genital tract, and tuberculosis of the seminal tract, etc. The more recent authors seem to agree upon a generalized infection, instead of a purely local one, and are more disposed to use the broader terms, such as tuberculosis of the seminal tract. Like this variety of names, one finds the same laxity offered in the methods of treatment.

Tuberculosis of the genital tract is invariably secondary to tuberculosis elsewhere, most commonly in the lungs or in the lymph glands. Kocher's<sup>1</sup> statistics showed in 451 cases of urino-genital tuberculosis that came to autopsy that over 80 per cent had pulmonary tuberculosis. Kuster states that by the more advanced methods of examination urino-genital tuberculosis would always be found to be accompanied by lesions elsewhere. Walker believes that tuberculosis of the epididymis is seldom primary, even in the lesions of the genito-urinary tract.

The path of infection of the disease is still in dispute, but authorities seem to be divided mainly into two groups, those who contend that the original infection is in the testes or the epididymis, and that the infection ascends along the vas to the prostate, and those who believe the original infection starts in the prostate or the seminal vesicles and descends toward the testicle. Among the first group are found Reclus, Senn, and others, particularly the writers of practically all of our latest texts and systems. To the second group belong Guyon, who

was probably the first; McFarland Walker, and Hugh Young, who are undoubtedly the strongest adherents. Numerous investigators report series of cases, in which the primary infection seems to be definitely shown to be in the seminal vesicles and others in the epididymis. Salleron, for instance, reports fifty-one cases of tuberculous epididymitis examined by him, in which the seminal vesicles were affected in only one; while Walker reports twenty-two cases examined by himself with special reference to the seminal vesicles, and he found them to be involved in twenty. Guyon<sup>1</sup> reported twenty-six necropsies in which the seminal vesicles were the primary site of the disease. He also reports an extensive clinical experience, in which he found the seminal vesicles or the prostate to be involved in the tuberculous process. Ernest Mark<sup>2</sup> states that as a primary manifestation of urino-genital tuberculosis, involvement of the body of the testicle must be considered extremely rare. Kidd,<sup>3</sup> on the other hand, states that he has seen tuberculosis confined to the testicle alone, and the same can be said of infections with the colon bacillus. Johnson<sup>4</sup> states that he believes infection occurs by both paths, but that the epididymis is first infected by a tuberculous embolus, in the majority of cases. When the lesion is primary in the epididymis, it is probably hematogenous in origin.

McFarland Walker, whom I have freely quoted, has done much to establish the theory of descending infection. He describes the pathology in a typical case, as consisting of an enlarged mass at the prostatic end of the vas, and another at the testicular end; while the portion between is nearly normal. Microscopic sections through the vesicular mass show a surrounding shell of lymphatic involvement, while the vas itself shows very little, if any, disease. The mid-portion also shows a normal vas with occasionally involved lymphatics. As the epididymis is approached, the lymphatic involvement gradually grows less and the mucosa becomes the site of the disease. The testicle does not show involvement.

Experimentally Walker inoculated the urethra in guinea-pigs with pyogenic organisms, and at the end of twelve hours obtained pure cultures from the seminal vesicles, epididymis, and from the lymphatics about the vas, while the lumen of the vas and the blood stream showed negative cultures. Although he had failed to produce similar results

\*Presented before the Minneapolis Surgical Society, March 8, 1923.

with the tubercle bacilli, Blandini had recovered them from the testicle, in similar experiments, at the end of thirty hours. He believes that the tubercle bacillus, like the pyogenic organisms and the gonococcus, cause a descending infection from the seminal vesicles to the epididymis through the surrounding lymphatics. A secondary ascending wave of infection may occur through the discharge of infected secretions. By previously traumatizing the testicle and inoculating the urethra with tubercle bacilli, in rabbits, the lesions resembled in every way those found in the human. Walker further explains that as the infection spreads along the lymphatics, it encounters more suitable soil in which to flourish in the epididymis, which becomes swollen and gives rise to the first clinical manifestations of the disease.

Diagnosis in the average case with the classical symptoms is not especially difficult. Special points of diagnosis may be briefly stated to be: involvement of the epididymis instead of the testes, as in syphilis, painless onset, chronic course, suppuration, and sinus formation; the sinus of tuberculosis being posterior, while that of syphilis is anterior, and frequent presence of tuberculosis elsewhere in the body. On palpation the epididymis is thickened and can be felt as a crest on the orchus. It is usually nodular and not very tender. The vas may be nodular and thickened for a distance along the canal. In acute cases a conglomerate mass that is painful may resemble gonorrhoeal epididymitis so closely that prolonged observation, the finding of gonococci, aspiration or even incision may be necessary to make a positive diagnosis.

Earliest symptoms usually relate to the lower pole and later to the upper pole. Caseation is also to be found first in the lower pole. The other epididymis becomes involved in a large number of cases. At the Thirtieth Congress of the German Surgical Association, Burns<sup>5</sup> reported seventy-eight cases treated by unilateral castration, in whom the other side became involved in 34 per cent in three months, 40 per cent in four months, and 60 per cent in the later cases. Buguljuboff<sup>6</sup> has reported 166 cases of tuberculosis of the epididymis, in whom 137 showed involvement of the other side in the average time of fourteen months. These findings seem to check with our own series, comprised of fifteen cases, in which 66 per cent (ten) showed involvement of both sides.

The treatment recommended for this disease varies from the most conservative to the extremely radical. F. Calot<sup>7</sup> states: "This form of tuberculosis should be treated by conservative methods. For eighteen years I have not performed castration; I exclusively make use of injections, and amongst 200 cases of children and adults, treated by this method, I have not had a single failure." Els,<sup>8</sup> on the other hand, advises early operation, removing the epididymis, but conserving the testicle when possible. If the testicle must be sacrificed, he recommends the reimplantation of a healthy piece of it into the scrotum for psychic and secretory effect. Schneider<sup>9</sup> recommends operation only after conservative treatment has failed. The operation should not be too radical, but conserve the testicle whenever possible. He urges post-operative treatment in all cases. He believes both the urine and the semen are infectious and he warns his patients accordingly. Young,<sup>10</sup> who advocates the radical operation in cases of tuberculosis involving the seminal vesicle and epididymis, has written a most complete article. He recommends the removal of both seminal vesicles and ampullæ with resection of both lateral lobes of the prostate through a perineal incision, and removal of the vas and diseased epididymis through an inguinal incision; by back and forth traction the deep portion of the vas is freed so that when possible all tissue is removed in one segment. He reports fifteen cases treated by radical operation with only one death at the end of one year. At the United States Veterans Hospital No. 68 (Asbury), we have chosen to treat these cases conservatively. They have all been studied by Dr. Josewich, attending specialist in tuberculosis, and have been treated medically for months before surgical treatment was advised. Operation was recommended in order to relieve the patient of one of his tuberculous foci. The epididymis and vas were removed and the testes preserved or resected when the disease had not advanced sufficiently to demand its removal. The proximal end of the vas was injected with pure phenol and in the later cases the wound was closed without drainage, even when a tuberculous abscess ruptured or was inadvertently opened during the dissection. Sinus formation is encouraged by drainage and most of these wounds closed primarily, healed like incisions for hernia. Two cases with involvement of the seminal vesicles presenting indurations and swelling to the size of a small orange, on rectal examina-

## TUBERCULOSIS OF THE EPIDIDYMS

QUESTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PRE-OPERATIVE TUBERCULOSIS ELSEWHERE	TBC PULMONARY T.B. TONSIL	TBC PULMONARY MID-CLAVICULAR LEFT-AXILLA METATARSAL PULMONAL	TBC PULMONARY	TBC PULMONARY	TBC PULMONARY	0	TBC PULMONARY AND PERITONEAL	TBC PULMONARY AND KIDNEY	0	0	TBC PULMONARY	0	0	TBC LEFT HIP	0
POST-OPERATIVE TUBERCULOSIS ELSEWHERE	0	0	0	KIDNEY BILATERAL T.B. BLADDER	0	0	0	0	0	0	0	0	0	0	0
DURATION OF LUMP IN TESTICLE	20-MO	5-MO	8-DA	2703-MO	5-MO	?	6-MO	5-MO	10-MO	RIGHT SIDE 6-MO LEFT SIDE 17-MO	24-MO	24-MO	7-MO	4-MO	55-MO
PAIN	+	+	0	+	+	0	+	+	+	+	+	+	+	+	+
ORIGIN IN LOWER OR UPPER PART	LOWER	UPPER	LOWER	LOWER	LOWER	?	LOWER	LOWER	LOWER	UPPER	LOWER	LOWER	LOWER	LOWER	LOWER
UNILATERAL OR BILATERAL	BILATERAL 2	UNDEVELOPED 1	1	2	2	2	2	1	1	2	2	2	2	1	BILATERAL 2
EPIDIDYMECTOMY	1	1	1	2	1	1 AND ORCHIDECTOMY	1	1 AND ORCHIDECTOMY	1	2	1 AND ORCHIDECTOMY	2	1 AND ORCHIDECTOMY	1 AND ORCHIDECTOMY	1
URINATION	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	FREQUENT	FREQUENT	NORMAL	FREQUENT	FREQUENT	NORMAL	NORMAL	NORMAL	NORMAL
WEIGHT GAINED OR LOST IN POUNDS	+14	+	0	-10	+11	-30	+5	-13	-15	0	-20	+15	0	+10	0
GENERAL CONDITION SINCE OPERATION	IMPROVED	IMPROVED	SAME	SAME	SAME	SAME	IMPROVED	IMPROVED	IMPROVED	IMPROVED	SAME	IMPROVED	SAME	IMPROVED	SAME
HOW LONG SINCE OPERATION	1YR-8MO	6-MO	4YR-2MO	1YR-2MO	6-MO	3YR-2MO	7-MO	7-MO	9-MO	9-MO	1YR	6-MO	1-WK	2YR-3MO	1-DA
TUBERCULOSIS OF KIDNEY	0	0	0	+	0	0	0	+	0	0	0	0	0	0	0
OPERATIONS ON KIDNEY	0	0	0	BI- LATERAL 0	0	0	0	NEPHRECTOMY 6-7-1912	0	0	0	0	0	0	0
BLOODY URINE SINCE OPERATION	+	0	0	+	0	0	0	+	0	0	0	0	0	0	0

Fig. 1. Chart showing a summary of the questions sent to the fifteen cases and the answers obtained.

tion, improved at once after epididymectomy and the pelvic mass decreased one half in size within a few weeks. The Young operation was considered in these cases, but as they were bad surgical risks, a conservative operation was performed. We have also been reluctant to adopt this procedure until its success has been more definitely established. All

operations performed by the author have been under local anesthesia.

Late post-operative care of all these patients has been supervised by Dr. Josewich. They have had general constructive treatment, including rest, heliotherapy, tuberculin, etc., and some have been sent south to government sanatoriums. Home treatment

is supervised and the patients are instructed to report at regular intervals for re-examination. In this respect the treatment is superior to that obtained by most of our private patients.

The surgical treatment of these cases has been under the direct supervision of Dr. A. T. Mann, our chief of the surgical service, and to him I am greatly indebted for the privilege of following these cases and of operating on most of them. I am also indebted to Dr. H. M. Bracken, our past commanding officer, and Dr. H. D. Luse, our present commanding officer, for their aid in securing data and for permission to make these reports. Dr. Waldschmidt, resident at Hospital No. 68, sent a questionnaire to each of our patients, and from these questions and answers compiled the following charts. From these charts, and our experience with these cases, we have attempted to draw a few conclusions.

#### CONCLUSIONS

1. In our series of fifteen cases of tuberculosis of the epididymis, ten, or 66 per cent, showed extragenital tuberculosis before the operation.
2. The average duration of symptoms was nine and one-half months before operation.
3. Pain, which is ordinarily considered negligible, was present in thirteen of our cases.
4. In twelve cases, the first symptoms arose in the lower pole of the epididymis.
5. Ten cases (66 per cent) were bilateral.
6. In five cases, one testicle was so badly involved that it had to be removed.
7. Eight cases report their general health to be improved, while seven report their general condition unchanged.
8. One case had tuberculosis of one kidney, which was removed before the operation on the testicle. A second case developed tuberculosis of both kidneys post-operatively.
9. Bloody urine was observed in three cases, two of which had renal tuberculosis.
10. Because tuberculosis of the epididymis is pathologically and clinically a secondary process, we have been conservative in our surgical treatment.
11. Treatment should be general, as well as local, and every available accepted treatment should be employed when indicated.

12. Local anesthesia was employed in all of the author's cases and seems particularly indicated in tuberculous patients.

13. Drainage promotes sinus formation and primary closure should be employed even in the presence of a ruptured tuberculous abscess.

#### BIBLIOGRAPHY

1. Walker, McFarland: *Lancet*, London, Feb. 15, 1913.
2. Mark, Ernest: *Journal of Urology*, Feb., 1921.
3. Kidd: *Oxford Medical Pub.*, London, 1920.
4. Johnson: *Surgical Diagnosis*, p. 733.
5. Young: *Archives of Surgery*, Mar., 1922.
6. Boguljuboff: *Archives of Surgery*, Mar., 1922.
7. Robin: *Treatment of Tuberculosis*, p. 484.
8. Els, H.: *Deutsche Medizinische Wochenschrift*, Apr., 1920.
9. Schneider: *Munch., Medical Wchnschr.*, Dec., 1921.
10. Young, H.: *Archives of Surgery*, Mar., 1922.

#### DISCUSSION

DR. A. T. MANN, Minneapolis: That was a very good paper Dr. Maxeiner has just read. There are some things, of course, which I do not expect to go through, but there are also some things of special interest. One is that practically all patients have tuberculosis in some other place, and, as a rule, primary tuberculosis here is very rare. Then as to the ascending or descending infection. That question has been threshed out for a great many years and quite convincing statistics have been gathered for one side and for the other. The probability is that both are correct, sometimes it is ascending and sometimes it is descending. That is, infection of the seminal vesicles, with or without the prostate, descending from the vesicles to the epididymis. The infection is very apt to spread from the seminal vesicles down toward the testicles, through the lymphatics, along the cord and along the vas.

While all the lymphatics I know about in the body run the other way—they run from the fingers up toward the shoulders, from the genitals up toward the groin, and so on—we do have examples of the change of the current in the lymphatics and infection in the opposite direction in a great many cases. Both sides are more apt to be involved than just one side, and that is, of course, a reason for doing very early work on a case which one sees early and with the involvement of only one side as far as we know, because if left alone practically all are involved on both sides later.

Then comes the question of saving the testicle. It has been very satisfactory to see these cases in which the blood supply is saved, the epididymis taken and part of the testicle taken, to see the ruddy red testicle (that is the color of it when you operate it) and have it largely saved with primary healing. There are some organs whose internal secretions we know very little about, but which are quite valuable. We know this to be true with the ovary

and the thyroid and some of the others. I presume it is also distinctly true with the testicle.

Where the testicle is to be put back as a graft, a part of it, I think is a different matter; that is a cosmetic thing. We know that when organs are transplanted, organs of a highly complicated structure, their end result is connective tissue. While there is great satisfaction in saving a part of the testicle which is to go back as a graft, we can only expect its end result to be a wad of scarred tissue. Where the blood supply is preserved, as is very needful and can be done in a good many cases, it is a very different matter, because it gives us a gland which supplies some material which is very much needed. Young's operation is a very radical one and I should hesitate to do that on most cases.

There is another thing—we must get our cases early and do conservative work. I think in this there has been a little too much tendency to wait and to put a patient down for general treatment. If there is tuberculosis in the epididymis the channels are destroyed and no channel for the semen is left, and so there is to my mind no reason for hesitating to remove the epididymis when it is diseased by tuberculosis. I think an early operation better, which removes the epididymis and as much of the vas as needs to be taken. Most of the cases have a history of distinct improvement in the vesicles if the epididymis and the vas have been taken care of. We should get these cases early, and remember that these cases are T. B. elsewhere, and that they should be given T. B. treatment after the operation, not simply operated and sent away. They need care, and with that care they have a good chance of getting well. The importance of primary healing, I think, is really a great step. There have been some of these cases with a good deal of soiling of the tissues from a discharge that looks like pus. We know we got primary healing in old pus tubes and apparently you can get the same thing here in the tuberculous field.

There is one thing more. When the testicle looks normal to the eye, as in some of these we have taken out, they show the tubercles in the testicle near the epididymis. Those cases, of course, have a chance to get well, too, if the main focus is gone. If they look good to the eye it seems to me that it is best to leave them in until something else shows up, because the channel up to the seminal vesicles is broken when the vas is taken and the epididymis gone. Any recurrence there would be a recrudescence of the orchitis and can be taken care of comparatively early if the case is kept under observation.

DR. R. E. FARR, Minneapolis: You go over the literature and you see a great diversity of opinion in regard to what we should do in these cases. That is illustrated by the difference in the advice of Young, for instance, and the advice of Dr. Maxeiner and Dr. Mann here tonight.

When we have cases of this kind, how are we to treat them? My impression is that perhaps at present the radical operation will be confined to those cases of double epididymitis where there is a marked suspicion of trouble in the seminal vesicles. There I believe if one is going to operate no operation could be too radical. The next question that is of great importance is, how frequently is the testicle involved with the epididymitis? I happened recently to

look the literature up especially carefully and my impression was that if we have an epididymitis of tuberculous origin, we are likely to have a tuberculous testicle on that side. In fact, I know of the statistics of some Englishman who showed forty-eight out of sixty-eight, I think.

Now, it has been advocated by some to divide the tunica albuginea and examine the testicle in these cases. I just bring up this point; I don't advocate it, but it is a question if that is not a good thing to do. It surely does no harm to divide the testicle. We have done that a number of times.

I have nothing more to say with regard to the actual treatment excepting to emphasize as much as possible the point that the doctor made in closing without drainage. Some other points were also brought up in the discussion—especially Dr. Mann's point with regard to transplanting—and I trust that his remarks will never reach Mr. McCormick, because it would be very depressing.

That leads me to another point and that is the question of cosmetics in these cases. I want here to mention a little scheme that we have used a few times—I think five, one double and three single—in which I transplanted a foreign body in the scrotum for cosmetic purposes. In all cases the foreign body put in was glass. One of these was a tuberculous orchidectomy case, and a man here in town, a friend of mine at the Club, has a hundred dollar check which he says he is ready to turn over to me any time I can prove it to him that that man is carrying a glass marble.

I remember the case of a man with atrophied testicles who wanted to get married. He came down to the St. Barnabas Hospital. This man was bothered very much about his condition. He did not even want to go bathing because he did not want the boys to notice wherein he differed from other individuals. I think it was Dr. Maxeiner I sent to get the marbles but he could not find any of the right size. I went down to the laboratory in St. Barnabas and I saw some oblong glass knobs on the laboratory shelves. Dr. Maxeiner filed the projecting parts off of them and that is what the man is carrying around now. They simulate very closely the appearance of the normal gland. Furthermore, it is not necessary for his friends to remember his name. They simply say, "There goes his nob's."

DR. FREDK. OLSON, Minneapolis: I think Dr. Maxeiner is to be congratulated on this unusual series of operative T. B. epididymi covering such a short period of time. It was my good fortune at one time to review some five hundred case histories of T. B. kidneys. In this series two hundred had been classified as regards nodules in the genitalia. Over 60 per cent of the males with T. B. kidneys had demonstrable foci in the epididymis, testicles, vas, prostate or vesicles. The fact that stood out on the group was the diagnostic importance of this finding. For the sake of the house officers present I would like to emphasize these pathognomic nodules which are so easily found. They will often put the examiner on the right track. Furthermore, a thoroughgoing x-ray examination of the urinary tract in a suspected T. B. case will reveal a large amount of information. It should be a routine procedure as 20 per cent of the cases will show shadows in the radiograph, many of which are diagnostic.

## TUBERCULOSIS IN SCHOOL CHILDREN: ITS DIAGNOSIS, CLASSIFICATION AND TREATMENT\*

J. A. MYERS, Ph.D., M.D.

Medical Director, Lymanhurst School for Tuberculous  
Children  
Assistant Professor of Preventive Medicine and Public  
Health, University of Minnesota

Minneapolis

The diagnosis of tuberculosis in children is attended by numerous difficulties. There are no short-cut methods but the physician is compelled to develop a chain of evidence consisting of many links if he is to diagnose this disease with a reasonable degree of accuracy. To detect tuberculous infection is easy in most cases; to detect a tuberculous lesion may not be difficult; but to differentiate between clinical and non-clinical lesions may tax severely the most resourceful physician.

The tubercle bacillus may gain entrance to the body through any of the natural orifices or through abrasions in the skin. The most common portals of entry are said to be the mouth and nose.

The primary lesion or focus develops where the bacilli first proliferate and invade the tissues. This lesion may appear in the skin, tonsils, lungs, intestine or in other parts of the child's body. From the primary lesion, the bacilli usually are carried by way of the lymphatics to the nearest group of lymph nodes. The bacilli are filtered out and retained by the nodes where they proliferate and invade the tissues of the nodes. The disease in the lymph nodes constitutes the secondary lesions or foci. Other bacilli may gain entrance to the blood stream from the region of the primary focus and later find lodgment in bones and other organs, where a secondary focus develops.

Many school children with diagnoses of tuberculosis are suffering from secondary lesions such as those of the bronchial nodes, cervical nodes, and bones. In the earlier years of school life active extensive pulmonary lesions are not common. As one passes to the later years of school life, particularly the high school ages, pulmonary tuberculosis of the adult type is not uncommon. Therefore, in discussing tuberculosis in school children, one must

consider these various forms of the disease including pulmonary tuberculosis.

In examining school children for tuberculosis, we encounter five main groups as follows: (1) children with no evidence of tuberculosis; (2) children with tuberculous infection without tuberculous disease; (3) cases of masked juvenile tuberculosis; (4) children with definite tuberculosis of the lymph nodes, particularly the bronchial and cervical nodes; (5) children with definite pulmonary tuberculosis.

Children of the *first group* may present very difficult problems, as the conscientious physician insists upon exhausting every possibility of detecting tuberculosis before he is willing to commit himself to the statement that tuberculosis does not exist in the body of a child. He knows that no test or phase of the examination is infallible, yet, it is his duty to the child, the family, and the community to render a negative diagnosis, when, after careful examination and observation, it is his honest opinion that tuberculosis does not exist.

In children of the *second group*, a positive tuberculin reaction usually is accepted as definite proof of tuberculous infection, but it gives us no information as to the duration, location, or extent of an infection or focus of tuberculosis. Children of this group have precisely the same findings as those of group one except that they show a positive reaction to tuberculin.

The *third group* recently was called to our attention by Cooke and Hempelmann. Children of this group have, in addition to a positive tuberculin reaction, such symptoms as loss of weight, frequent colds, occasional elevation of temperature and cough which cannot be accounted for on other grounds. One may be unable to locate a tuberculous lesion, but it is believed that following the infection from the tubercle bacillus, somewhere in the child's body there may exist for some time a pathologically active process which is not capable of producing marked symptoms, or being located by examination. Dunham believes "potentially tuberculous" should be a valid diagnosis during childhood. I am of the opinion that the term "undetermined tuberculosis" is the best term for our out-patient service to use until such cases can be observed in the school for a considerable period of time.

\*Read before the Consulting Medical Staff of the Lymanhurst School for Tuberculous Children, March 27, 1923.

The *fourth group* of children consists of those with demonstrable tuberculous lesions of the bones and lymph nodes, particularly the bronchial and cervical nodes. Tuberculosis of the bronchial lymph nodes always has been difficult of diagnosis. Dr. John B. Hawes, 2nd, recently has given us much help by the presentation of the following five diagnostic points which he has used for a long time in the diagnosis of *bronchial lymph node tuberculosis*:

"1. A positive skin tuberculin test, unless the child has recently recovered from measles or any of the other acute infections which might lead to a negative test, or unless the child has advanced tuberculosis.

"2. A definite history of exposure from either human or bovine sources of tuberculosis.

"3. Constitutional signs and symptoms, particularly loss of weight or failure to gain weight, along with 'ease of tire' or undue fatigue, fever or rapid pulse.

"4. The presence of enlarged bronchial nodes as shown by x-ray or by clinical examination of the chest.

"5. The absence of other evident sources of infection or toxemia, such as (a) infected tonsils or adenoids, (b) carious teeth, (c) intestinal disturbances and particularly a chronic appendicitis, and (d) other possible sources of infection, such as middle ear, lymph nodes in the neck, bronchopneumonia, measles, whooping cough, etc."

Dr. Hawes calls attention to the fact that one must insist upon a positive tuberculin test and, in the great majority of cases, enlarged bronchial nodes revealed by the x-ray before diagnosing tuberculosis. He regards the other three points as important, but not essential to the diagnosis.

The experiences of the Lymanhurst Consulting Staff in the examinations of several hundred children have proved that a child may have no physical signs of pathology in the chest and yet have very definitely enlarged bronchial nodes revealed by the x-ray. To be sure, we are thoroughly cognizant of the fact that bronchial node enlargement has other etiological factors. However, enlarged bronchial nodes, particularly if calcification is present, together with a confirmed positive skin reaction to tuberculin, should be reasonably conclusive evidence of tuberculosis of the bronchial lymph nodes.

We have seen also, in many cases, mouth, throat, and ear infections produce symptoms which previously led to the diagnosis of tuberculosis. At no time were we able to demonstrate a tuberculous lesion and on removing these foci all symptoms disappeared.

We must not forget that there is no pathognomonic symptom in tuberculosis, but that the diagnosis of this disease must follow a most thorough examination based on the above diagnostic points and must represent the physician's very best judgment after the most careful deliberation. One does not thoroughly appreciate one's responsibility in rendering a diagnosis of tuberculosis until the stigmata thereby heaped upon the recipient have been considered most carefully. On the other hand, one cannot estimate the responsibility assumed by passing over a case carelessly and rendering a negative diagnosis. This may lead the patient to the life of an invalid and cause the patient to expose innocently large numbers of other persons. I know of no other place where the golden rule should be more rigidly applied.

*Tuberculosis of the Cervical Lymph Nodes.*—Enlarged cervical lymph nodes are seen frequently in children, and inasmuch as tuberculosis is a common cause of enlargement of these nodes, one must consider this disease in differential diagnosis. Committees of the National Tuberculosis Association have set forth very helpful diagnostic standards for tuberculosis of the cervical lymph nodes. The *first* of these is *enlargement of the cervical nodes*. The nodes must be large enough to be seen or felt easily. *Second*, a history of *exposure* to human or bovine sources in the presence of enlarged nodes is of some significance, although it in no way establishes the diagnosis. On the other hand one should not be influenced by a negative history of exposure. *Third*, there are *other causes of enlarged cervical nodes*, such as Hodgkin's disease, acute and chronic infected tonsils, carious teeth, pharyngitis, pediculosis, otitis media, syphilis, etc. Enlargement of nodes posterior to the sternomastoid muscle usually is due to causes other than tuberculosis. *Fourth*, the *presence of constitutional signs and symptoms*, such as those given under bronchial node tuberculosis, when there is enlargement of the cervical nodes, should make one suspicious of tuberculosis. *Fifth*, the *duration of the enlargement of the nodes* is important. It is stated that any node

which has been enlarged over a period of three months or more, with no other explainable cause should be regarded as a tuberculous node. *Sixth*, the relation of diseased tonsils and carious teeth to enlarged cervical nodes must be considered seriously. Inasmuch as these diseased organs are so frequently the cause of enlarged nodes, they should be removed before one diagnoses tuberculosis. If the removal of all such foci of infection has no effect upon the enlarged nodes, tuberculosis should be suspected. *Seventh*, a biopsy should be performed in all cases in whom the diagnosis is uncertain. Usually, it is not difficult to remove and study microscopically one of the smaller nodes. Inasmuch as the primary focus may be in the tonsils or adenoids, it is always well to study these organs microscopically for tuberculosis when they are removed. If tuberculosis is present in them, it is reasonably safe to conclude that the enlargement of the cervical nodes is due to this disease. *Eighth*, confirmatory evidence, such as a positive tuberculin reaction or the location of a definite tuberculous lesion elsewhere in the body should be sought.

**Pulmonary Tuberculosis.**—The *fifth group* consists, for the most part, of children above the age of ten or eleven years. However, pulmonary tuberculosis may exist at any age. Formerly, it was believed that each case of the adult type of tuberculosis evolved from a primary infection which the individual acquired in childhood. In more recent years, however, sufficient evidence has accrued to convince tuberculosis workers that the adult type of lesion may be due to reinfection. In fact, many workers now believe that at least 50 per cent of such lesions are due to reinfection.

One cannot place too much emphasis upon the past history and present symptoms such as prolonged exposure, idiopathic pleurisy with effusion, hemoptysis, persistent cough, expectoration, pain in the chest, fever, rapid pulse, loss of weight, impairment of strength, dyspnea on slight exertion, night sweats, amenorrhea and anorexia. None of the symptoms mentioned are diagnostic, but any one of them should cause us to consider tuberculosis.

The diagnosis of pulmonary tuberculosis has been facilitated greatly by Dr. Lawrason Brown's five diagnostic points arranged in the order of their importance as follows:

1. *Tubercle bacilli.*
2. *Moderately coarse râles* above the second rib and third dorsal spine.
3. *A parenchymatous roentgen ray lesion* above the second rib and third dorsal spine.
4. *Hemoptysis.*
5. *Idiopathic pleurisy with effusion.*

If none of these diagnostic points are present, Brown believes one is justified in rendering a *negative diagnosis*. If only hemoptysis or idiopathic pleurisy with effusion is present, the patient should be designated a *tuberculous suspect*. There are patients in whom the x-ray reveals parenchymatous lesions above the second rib and third dorsal spine, but diligent searching brings us no other evidence of pulmonary tuberculosis. Brown gives such cases a diagnosis of *demonstrable non-clinical tuberculosis*. Patients who have parenchymatous lesions revealed by x-ray or moderately coarse râles or tubercle bacilli in the sputum or hemoptysis and idiopathic pleurisy with effusion are diagnosed *demonstrable clinical tuberculosis*, active or inactive, depending upon the symptoms.

In speaking of the activity of a tuberculous lesion, we refer usually to clinical activity. However, we must bear in mind that pathological activity of a tuberculous lesion exists before and long after there are any manifestations of clinical activity.

Clinical activity of a tuberculous lesion is determined ordinarily by the presence of a temperature elevation (above 99 degrees for males and 99.6 for females) and an accelerated pulse rate (above 90 for males and 96 for females). These symptoms should persist for approximately one week when other causes have been ruled out. In small children the rectal temperature must be above 100°. Other symptoms which may denote activity of a tuberculous lesion are blood spitting, night sweats, cough, expectoration, chills, lack of endurance, loss of weight and pleurisy. (These symptoms do not necessarily denote clinical activity of the tuberculous lesion, but they lead one to suspect such activity.) The presence of tubercle bacilli in the sputa usually indicates activity of the disease; however, a small percentage of cases with no manifestations of clinical activity have positive sputa.

Stereoscopic x-ray plates made and interpreted by well trained roentgenologists undoubtedly throw

light upon the activity of a tuberculous lesion. Some roentgenologists believe it is possible to detect activity in 75 to 85 per cent of the cases by a careful study of stereoscopic plates.

The tuberculin test and the complement fixation test, as yet, have not proved of much real value in differentiating between active and non-active tuberculosis. Many are looking forward with great anticipation to the outcome of Larson's work on the precipitin test. A number of workers believe the auto-urine test throws considerable light upon the activity of tuberculous lesions.

Frequently, it is impossible to determine whether a tuberculous lesion is active until the patient has been given a period of observation, preferably in bed in a hospital, where the temperature and pulse may be taken and recorded at regular intervals and the patient may be observed carefully over a sufficient period of time.

In recent years, a great deal has been said about peribronchial tuberculosis. This diagnosis is made from the x-ray plate only. However, the physical findings over the area involved may deviate slightly from the normal. Some workers now believe that the x-ray findings in peribronchial tuberculosis simply represent the course which the disease takes in traveling from a primary infection near the periphery of a lung to the hilus. In most cases, peribronchial tuberculosis is of no clinical significance. However, a small percentage of these cases produce positive sputa, making them highly important public health subjects.

#### CLASSIFICATION

School children examined for tuberculosis may be classified as follows:

1. No evidence of tuberculosis.
2. Tuberculous infection present—no tuberculous disease.
3. Suspected tuberculosis, masked juvenile tuberculosis or potential tuberculosis.
4. Demonstrable tuberculosis of the lymph nodes, bones, etc.
5. Pulmonary tuberculosis.
  - a. Demonstrable, non-clinical.
  - b. Demonstrable, clinical.
    1. Minimal—A.
      - B.
      - C.

2. Moderately advanced—A.
  - B.
  - C.
3. Far advanced—A.
  - B.
  - C.

The following paragraphs taken from the American Sanatorium Association's Classification of Pulmonary Tuberculosis\* explain clearly the lesions allowable for the minimal, moderately advanced and far advanced stages of pulmonary tuberculosis:

#### "Under Minimal:

##### "1. Slight lesion:

"(a) *Physical Signs:* Possibly slight depression above or below the clavicle, lessened movement of the chest, narrowing of the isthmus of apical resonance or restricted diaphragmatic excursion; slight or no impairment of resonance; slight or no change in quality or intensity of breath sounds, with or without some change in the rhythm (that is, prolonged expiration); vocal resonance possibly slightly increased; râles present, absent or transitory. If sputum contains tubercle bacilli, any of these.

"(b) *Roentgen Findings:* Roentgenograms to show lessened transmission of light in the form of poorly defined, light mottling or diffuse haziness interpreted as infiltration or conglomeration of tubercles, or more intense shadows of a well-defined, stellate or fibrillar character interpreted as fibrosis, with or without opacities interpreted as calcification.

"2. *A Small Part of One or Both Lungs:* Total volume of involvement, regardless of distribution, shall not exceed the equivalent of the volume of lung tissue which lies above the second chondrosternal junction and the spine of the fourth or body of the fifth thoracic vertebra on one side.

#### *Under Moderately Advanced and Far Advanced:*

"3. *Lesion Allowable under Moderately Advanced:* One or both lungs may be involved but the total involvement shall not exceed the following limits:

"(a) Slight disseminated infiltration of fibrosis which may extend through not more than the equivalent of the volume of one lung.

"(b) Severe infiltration with or without fibrosis

\*American Review of Tuberculosis, 6:111, Sept., 1922.

which may extend through not more than the equivalent of one-third the volume of one lung.

"(c) Any gradation within the above limits.

"(d) Total diameter of cavities, if present, should not exceed 2 cm.

"4. *Physical Signs of Moderately Advanced Lesions* are more variable than those of *minimal* lesions and do not usually determine the exact extent of the involvement.

"5. *Roentgen Findings in Moderately Advanced Lesions*: Roentgenograms to show shadows similar in character to those described under *minimal* (paragraph 1-b) but more extensive or more intense, with or without areas of rarefaction interpreted as cavity formation.

"6. *Definite Evidence of Cavity Formation*: Tubercle bacilli usually present; elastic fibres may be present in sputum. Physical signs may not be definite but a combination of any four of the fol-

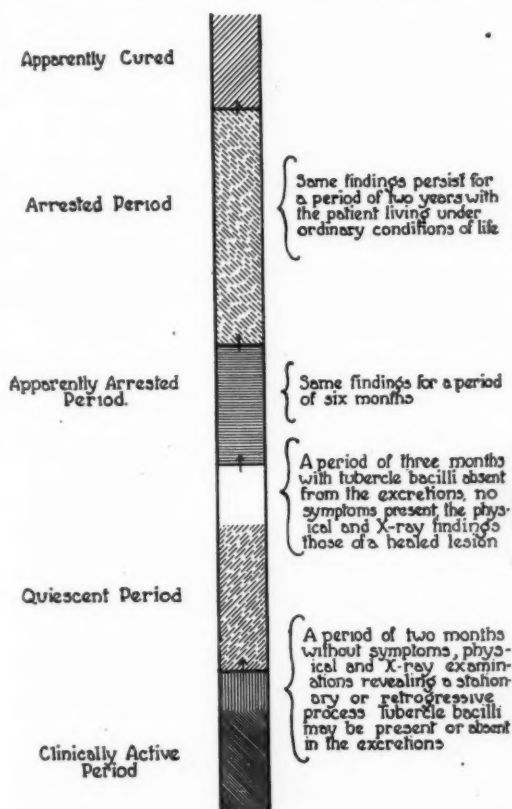


Fig. 1. Diagram to show the various stages through which the patient passes from clinically active disease to the apparently cured stage.

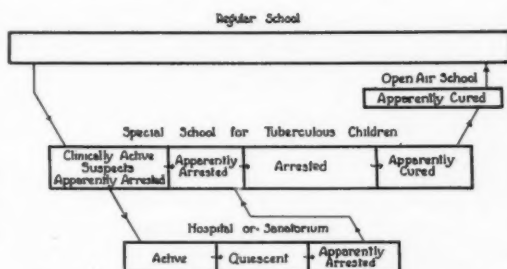


Fig. 2. Diagram showing a practical method of caring for tuberculous children in city schools.

lowing signs is to be taken as indicative of cavity formation: (1) bubbling or consonating râles; (2) cracked-pot note; (3) amphoric breathing; (4) intense whispering pectoriloquy; (5) post-tussive suction. Roentgenograms to show single or multiple areas of rarefaction surrounded by dense borders.

"7. *Serious Complications*: These should be limited to tuberculous complications affecting any organ or tissue to such an extent as to impair seriously local function, as determined by symptoms, and influence unfavorably the prognosis of the case."

A, B and C are used to indicate symptoms only. A indicates "slight or no constitutional symptoms, including particularly gastric or intestinal disturbance or rapid loss of weight; slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent." B indicates moderate symptoms with "no marked impairment of function either local or constitutional." C indicates severe symptoms together with marked dyspnea on exertion, marked weakness, anorexia and tachycardia.

After a case of active tuberculosis has so improved as to be without constitutional symptoms, to have physical and x-ray findings of a stationary or retrogressive lesion, whether bacilli are present or absent in the excreta for a period of at least two months, the patient may be classified as *quiescent*. If improvement continues so that all constitutional symptoms are absent, the physical and x-ray findings are those of a healed lesion and bacilli are absent from the excreta for a period of three months, the patient is placed in the *apparently arrested* class. When the same conditions have

persisted over a period of six months, the disease is said to be *arrested*. If the patient under ordinary conditions of life continues to present the same findings over a period of two years, he may be placed in the *apparently cured* class.

#### TREATMENT

Children who, upon careful examination, show no evidence of tuberculosis as well as children with tuberculous infection with no manifestations of disease, should be returned to their regular schools with any recommendations as to subsequent examinations and observation which the examining physician may see fit to make.

Children with suspected or undetermined tuberculosis (potential tuberculosis or masked juvenile tuberculosis), with some evidence in favor of tuberculous disease, should be placed in an observation ward such as that operated in connection with the Lymanhurst School for Tuberculous Children in Minneapolis where they are studied intensively over a sufficient period of time.

All children with demonstrable tuberculous lesions of the lymph nodes, bones, etc., should be transferred from their regular school to a special school for tuberculous children such as the Lymanhurst School in Minneapolis. After careful observation in such a school, those found to have clinically active disease are transferred to institutions where such conditions in children are given special attention, such as the Glen Lake Sanatorium at Oak Terrace, Minnesota, or the State Hospital for Crippled Children in St. Paul. These children always should be treated for the general disease with its local manifestations. Therefore, the usual anti-tuberculosis regimen should be instituted at once and continued as long as necessary. In addition, such special therapeutic measures as x-ray, sunlight, surgery and tuberculin may prove of great value when indicated. Such cases should be retained in the hospital until the tuberculous process is apparently arrested, when they should be returned to the school for tuberculous children.

Children with demonstrable tuberculous lesions of the lymph nodes, bones, etc., with no signs of clinical activity should be retained in the special school for tuberculous children. If the case is one causing bone or joint deformity, it is best treated in a school for deformed children, such as the Dowling School in Minneapolis, provided there are

contra-indicating conditions making contact with other crippled children potentially dangerous.

Children in the special schools for the tuberculous who have become apparently cured should be transferred to an open-air school under competent supervision, and, when the condition warrants, back to their regular schools.

Children with demonstrable pulmonary tuberculosis should be sent to the school for tuberculous children. If, under careful observation, the lesions prove to be of the non-clinical type, the children should be transferred to an open-air school under competent supervision. If, on the other hand, the lesions prove to be of the clinical type, and there is any evidence of clinical activity, the children should be transferred at once to a children's ward in a hospital or sanatorium for the tuberculous. They should remain there until the disease is apparently arrested, when they may be readmitted to the school for tuberculous children.

Children with inactive clinical pulmonary tuberculosis admitted to the school for the tuberculous may remain at their school work, but should be kept under very close observation.

When the pulmonary disease is declared apparently cured, the child should be transferred to an open-air school and, at a safe time, back to the regular school.

There are two outstanding points which must be emphasized everlastingly in dealing with tuberculous school children.

1. The welfare of the community.
2. The welfare of the individual.

We know that certain cases not clinically active are capable, under certain conditions, of discharging tubercle bacilli from their bodies. Therefore, there is a possibility of others becoming infected from such cases. This is one point in favor of the special schools for tuberculous children. The second and stronger point is immediately from the standpoint of the individual and more remotely from the standpoint of the community. In such special schools children with tuberculous lesions may learn to save their lives and at the same time develop into safe, useful and happy citizens; whereas, without such schools, not only would the lives of many such children be lost, but many others would be exposed while they were passing through the various stages of the disease to death.

## HYPOTHYROIDISM\*

A. M. SNELL, M.D.

*Mankato, Minn.*

The recent widespread interest in endocrinology has given the medical profession a new incentive to the study of disorders of growth and metabolism. Unfortunately there has been a great deal of extravagant theorizing associated with this study, serving to bemuddle the rather scanty amount of exact knowledge that we possess. Swale Vincent, Cannon and others have called attention to many of the fallacies in reasoning regarding the endocrines, and emphasized the fact that further experimental data are required before even some of the widely accepted views on the subject can be confirmed.

The hypothesis of thyroid function is supported by much sound clinical and experimental evidence; we have accurate methods of laboratory diagnosis in thyroid disorders, and in the treatment of hypothyroidism we have a specific substance at our command. However, not all disorders associated with lowered basal metabolic rate are hypothyroidism, and neither is a condition necessarily due to primary hypothyroidism because it is benefited by thyroid feeding. The true primary hypothyroid states are relatively uncommon, and, probably for that reason, frequently escape diagnosis. It is the purpose of this paper to present a group of proven cases, and to emphasize certain points in their diagnosis and treatment. The cretins and one case of myxedema were observed on the service of Dr. L. G. Rowntree at the University Hospital, and it is through his courtesy that I am permitted to report them. The other myxedema patients were seen in private practice.

According to Plummer the primary hypothyroid states are classified as: (1) that which follows faulty prenatal development or destruction of the thyroid, cretinism; (2) that which follows post-natal destruction of the thyroid, myxedema; and (3) the status in which the thyroid temporarily does not (because of functional disability) respond to the demands of the body. He considers the true criterion of hypothyroidism to be the appearance of edema when the metabolic rate falls lower than minus 18 per cent.

Seven cases belonging to group (1) were observed; all were inmates of the Faribault school for the feeble-minded. Unfortunately no adequate histories could be obtained, although in each case it was known that the abnormalities noted had been present since birth. In only one case (that of sisters) was there any familial history. All of these patients were natives of this state. The physical findings of all are rather stereotyped and therefore the presentation of a typical picture is attempted before the discussion of details in individuals.

The patient Hilda L. was 31 years old, female, height 119.3 cm., weight 37 kg. She remained most of the time in a curled up "fetal" attitude, slept a great deal and appeared to be oblivious to her surroundings. The head was proportionately large, particularly in the antero-posterior diameter; the limbs short in proportion to the trunk length. The bridge of the nose was retracted, the alae very wide; the lips and ears were thickened, the palpebral fissures narrow. The tongue was greatly enlarged and showed the indentations of the teeth; no thyroid tissue was palpable in the short thick neck. The voice was hoarse and croaking.

The cutaneous changes were particularly striking; the skin was cold, rough and scaly, and there was no perspiration. The hair of the head was very sparse, coarse and stiff, and, while there was practically no hair at all on the body, a bristly growth was noted on the face. The characteristic edema of the disease was everywhere in evidence, giving the body surface a tense inelastic feeling. Supraclavicular fat pads, and pads on the dorsum of the hands and feet were prominent features; the extremities were wide and stubby, presenting the typical "spade" appearance. There were no neurological lesions, but the muscles generally were stiff and indurated, and all movements were slow, clumsy and suggestive of a spastic condition. Her gait was decidedly waddling. The basal metabolic rate of this patient was minus 20 per cent and the mental age 22 months; reaction time to sound could not be determined.

The second case, A. H., female, aged 24, resembled the first in all essential particulars; her metabolic rate was minus 12 per cent and her mental age, which had been 3 years in 1910, was then 4 years. Her reaction time to sound was 0.289 second. The cutaneous changes, mental symptoms

\*Read before the Southern Minnesota Medical Association, Mankato, December, 1922.

and edema differed from those of H. L. only in degree, and the same disproportions of growth were noted.

I. A., female, aged 15, was the largest of our group, being 136 cm. tall and weighing 63 kg. Her family history was good; she had walked first at the age of five years; her menstruations had begun recently. She was particularly morose and ugly; her speech was indistinct and her voice hoarse and deep. The skin was very rough, coarse and dry; on the back many bluish subcutaneous nodules were seen. The extremities and face presented the usual edema. Her basal metabolic rate was minus 23 per cent; her mental age 44 months, and reaction time 0.399 second.

Consuelo F., aged 22, was active, smiling and friendly. Nevertheless, she had marked mental retardation, her mental age being 54 months, and she was too stupid to permit of reaction time calculations being made. Her basal metabolic rate was minus 14 per cent. There was a luxuriant growth of fine hair all over her back, and her skin was ichthyotic. The muscles were extremely hard and stiff, feeling almost like wood to the touch. As a consequence her gait was very clumsy and staggering and she had a tendency to fall backward. A chest plate showed a persistent thymus, and x-ray studies showed delay in epiphyseal closures, her bony development being about that of a 16-year-old.

The fifth and sixth patients were sisters. The younger child, F. D., aged 15, was the milder case and lacked the typical appearance of the others. Her mental age, however, was 32 months, the same as that of her sister, and she was particularly dull and apathetic. There was a growth of very fine soft dry hair practically all over her body. The cutaneous findings were very definite; the extremities were cold, bluish, and swollen; a peculiar induration of the right thumb was noted. Her breasts were very well developed, and she was said to have menstruated. Metabolic rate was minus 13 per cent, reaction time .199 second.

The older sister, N. D., aged 25, presented a typical cretinoid facies, but her cutaneous changes and edema were confined chiefly to her lower extremities. In other areas the skin was fairly moist and soft; she also had an extensive growth of hair over the body. "Pot-belly" and macroglossia were present. Her metabolic rate was

minus 22 per cent, her reaction time correspondingly slow, 0.667 second. Both sisters had the usual spastic muscular phenomena with stiff and waddling gait.

These two patients were chiefly remarkable in having palpable thyroid tissue; in both there were large adenomatous masses attached to the isthmus and both lobes of the gland were palpable. There was no palpable thyroid tissue in the other five patients.

By far the most striking member of the group was William A., aged 31; he was the smallest, weighing 26 kg. and being 115 cm. tall. He presented few of the marked cutaneous changes seen in the other six patients and very little edema was demonstrable. His abdomen was prominent, his extremities stubby and he had large supraclavicular fat pads. Growth abnormalities were manifested in his relatively short limbs and large doliocephalic skull. His genitalia were atrophic, and he had no secondary sexual characteristics. His nose constituted fully a third of the width of his face, and its bridge was retracted. While he was 55 months old mentally, his reaction time was 0.525 second, and his speech was unintelligible. His metabolic rate, the highest in the group, was minus 7 per cent.

In summarizing the important points in this group, the diagnostic triad of developmental defects; feeble-mindedness, and myxedema is prominent. Dwarfism was a feature in all but one case; and in all there was evident disproportion between total and sitting height. The skulls of five of the patients were doliocephalic, and, according to an anthropologist, Dr. Jenks of the University faculty, very primitive in type. A dental consultant noted the marked spacing between the teeth, their tendency to decay, and striations on their surface. In no case had the third molars erupted. Delayed reaction time to sound was a constant feature and the results in the Binet and performance tests demonstrated their mental retardation. The speech of all was practically unintelligible.

The third feature, myxedema, was present in all; in attempting to chart the amount of edema (on a basis of one to four) with the basal metabolic rate, it was seen that the two, as might be expected, ran very nearly parallel. However, no definite relationship between the basal rate, mentality and reaction time could be determined. The lower the rate,

the more striking were the changes in the skin; moderate tendencies toward ichthyosis were noted in six cases. The hair of all patients was dry and sparse, and varying degrees of alopecia were present. In three cases, a growth of fine lanugo-like hair was seen on the body. Spasticity and indurations noted in the muscles were considered to be due to myxedematous deposits in their substance.

Diminished heat production was evidenced by a generally subnormal temperature, pulse, and respiration, and by the lowered basal metabolic rates, which ran roughly parallel to the severity of the case. Since these patients could not give the best possible co-operation in this work, it is believed that in some cases the metabolic readings are slightly higher than the correct figure.

The other laboratory findings yielded additional diagnostic data. Urinalyses were negative. All of the patients had negative Wassermanns. Four of the patients had a definite secondary anemia, and four had the lymphocytosis so commonly associated with thyroid disorders; in only one case was this particularly marked. Blood chemistry in all patients gave results within normal limits. Five of the cases had definite hypotension with very low pulse pressure; in the others blood pressure was normal.

The prognosis in this group was considered to be rather poor, but treatment in one case was very gratifying. H. L., the first patient described, was given 6 mg. of thyroxin intravenously; a week later her metabolic rate had risen from minus 20 per cent to plus 4 per cent, and after another 6 mg. dose, by mouth, was exactly normal at the time of her discharge. She had lost five pounds, her skin was much softer and most of her edema had disappeared. Her mental condition had improved markedly; she spoke a few words, knew the head nurse and intern, and played a little with some toys.

The second group of primary hypothyroid states, myxedema, presents a somewhat different symptomatology. Since the destruction of the thyroid takes place after growth is more or less advanced and the mentality developed, the features of developmental defects and feeble-mindedness are either absent or much modified. Mental symptoms, nevertheless, are seldom lacking and the various physical changes due to diminished heat production

and myxedematous deposits are usually conspicuous in well developed cases.

When thyroid destruction takes place before puberty an interesting gradation between cretinism and adult myxedema may result, as in the case of L. P., a well built male of 37. He had been subnormal since childhood and had never reached sexual maturity, his genitalia being totally undeveloped and secondary sexual characteristics entirely absent. He had a typical myxedematous facies, with extensive non-pitting edema of the extremities; his skin was thickened, cold, and very scaly. Macroglossia and fat pads were noted. His mental age was 12.5 years; he was emotionally unstable, cried frequently, and was very childish in speech and actions. His basal metabolic rate was minus 26 per cent.

Five cases of myxedema were seen recently at the Mankato Clinic. Lack of time prevents a detailed discussion of these patients, but their clinical features were sufficiently similar to permit of group description. The characteristic edema of the disease occurred in all, and was particularly marked about the face. The puffy, expressionless facies with scanty eyebrows and hair gave in each an immediate clue to diagnosis. The skin in each instance was dry, scaly and coarse; perspiration was absent or nearly so. As in the cretins, axillary and pubic hair was scanty or entirely missing. Speech was slow and deliberate and pronunciation imperfect. Macroglossia and cervical fat pads were noted in three cases. Mental symptoms were present in all, ranging from loss of memory and attention in the mildest to a low grade dementia in the most severe case. One patient, a male aged 60, had a marked anemia, which, taken in connection with his edema and a slight albuminuria, had led to a previous diagnosis of nephritis. A second patient had an indolent leg ulcer, which showed its first signs of healing after an intravenous dose of 10 mg. thyroxin. Another case, with every classical symptom of the disease, had localized indurations in her muscles, reminiscent of the changes found in the cretins. These were quite painful and tender, did not disappear until her metabolic rate had reached normal and reappeared when she neglected treatment. In only one case in the group was there any palpable thyroid tissue, and in this patient a

large adenoma had been removed six years previously. She developed symptoms of myxedema coincident with the recurrence of her goiter, which proved at operation to be of the colloid type.

The laboratory findings in the myxedema patients were similar to those in the cretins. Three patients had traces of albumin and rare casts; and of these, two had slight hypertension, two had anemia and three a lymphocytosis. Basal metabolic rates varied from minus 17 to minus 39 per cent and the usual relations existed between the metabolic rate, the general severity of the case, and the amount of edema present.

In reviewing this group, it is apparent that there is an abundance of clinical features in hypothyroidism which should render the diagnosis relatively easy. The principal difficulty lies in the identification of early and atypical cases and in these the determination of basal metabolic rate is of great value. Slightly lowered rate, however, is not sufficient evidence for a diagnosis of primary hypothyroidism; and it is generally believed that even with rates of minus 20 per cent the diagnosis is questionable unless there are definite physical findings. To explain many of the debatable cases, Plummer has advanced the hypothesis of secondary hypothyroidism, a theoretical state existing when conditions of the body do not demand the maintenance of the normal supply of thyroxin. This group would include the minor thyroid deficiencies and possibly other conditions associated with lowered metabolism. The diagnosis of true primary hypothyroidism should be reserved for those cases in which lowered metabolic rate is associated with proportionate physical findings.

While the matter of treatment is familiar to all, there are certain points worthy of mention. The establishment of a proper dosage of thyroid extract requires careful clinical observation. Frequently variations in potency and rate of absorption of the drug cause difficulty and lead to unsatisfactory results. Treatment with thyroxin has many advantages. It can be given satisfactorily by mouth or intravenously, and when given by the latter method its effect upon the metabolic rate can be accurately predicted. Observation of the patient and determinations of the basal metabolic rate at intervals are necessary for the best results, no matter which drug is used.

## DISCUSSION

DR. L. G. ROWNTREE, Rochester: I greatly appreciate the opportunity of hearing Doctor Snell's excellent paper. In the study of hypothyroidism pictures are of importance. Osler said, "Much misunderstanding exists as to the exact definition of a cretin, illustrated by the fact that at least one-half of the illustrations sent me from different institutions did not belong to this type of idiocy." In his textbook he makes the statement, "The diagnosis is easy after one has once seen a case, or good illustrations." There is a striking family resemblance in many cases of cretins, as can be seen from the accompanying photograph. Family resemblance is also marked in other diseases of the glands of internal secretion such as in exophthalmic goiters and Froelich's syndrome.

The most important physical manifestations are infiltrated skin, scanty, coarse hair, thick lips, fat pads, spade-like hands and the tendency to scaling. The coarse croaking voice is also of importance.

A marked slowing of the mental condition has long been known in hypothyroidism. However, quantitative studies by reaction time determinations, Binet and performance tests, have not been made before so far as I know. Through the kindness of Doctor Haggerty, of the University of Minnesota, these more exact measurements of mentality were made possible. In differential diagnosis, juvenile myxedema can often be distinguished from cretinism. Mongolianism belongs in another category.

Myxedema is familiar as a text-book picture. However, in practice it is often overlooked. Anders says, "Out of twenty-seven cases belonging to my series not less than twenty, or 74 per cent had gone unrecognized by one or more physicians, including physicians of large caliber. The average duration for these twenty-seven cases was five years. Unless the physician is always alert and has a high index of suspicion, myxedema is sure to be overlooked. Recently a patient was seen in the Clinic who was himself a physician and who had seen some of the best men in Chicago. Although he had been a victim of myxedema for years his condition had not been diagnosed by himself or by his former physician.

Slow pulse, increased turgor of the tissues, infiltration of the skin, a tendency to ichthyosis and marked scaling of the skin of the legs should always raise suspicion.

Hypothyroidism of the myxedema and cretin type is not infrequent. Doctor Plummer considers two forms of hypothyroidism, namely, primary and secondary. The secondary type is of unusual interest, but to date little is known of it. In this type edema is frequently absent. Marked pallor of the skin, ichthyosis and a lowered mentality are the common characteristics. In the female there is usually a lack of menstruation. Doctor Plummer has called my attention to a tendency to negativism in some of these cases. Anorexia nervosa frequently exhibits a lowered rate and patients with low rate often improve markedly on thyroid treatment. In suitable cases of hypothyroidism thyroxin accomplishes miraculous transformations.

## SURGICAL RELIEF OF DYSMENORRHEA\*

C. C. KENNEDY, M.D.

Surgical Staff, Swedish Hospital  
Minneapolis

The cases of dysmenorrhea that are due to pathological antelexion and to retroflexion causing obstruction and stenosis of the canal, and those caused by malposition of the uterus, are the ones to be dealt with in this paper.

The surgical procedure most frequently resorted to for the relief of painful menstruation is dilatation of the cervix and light curettage of the uterus for the purpose of stimulation. This procedure gives a varying percentage of cures and relief in the hands of different surgeons, some reporting as high as 60 per cent of cures and others reporting a much lower percentage. For example, Stacy and

Joseph<sup>9</sup> report only 28 per cent relieved by this procedure alone, and Crossen<sup>2</sup> states that in his hands a large proportion of cases are benefited for several years and that the number is very small in which there is no definite improvement from this operation.

Forssner<sup>4</sup> describes a method of dilating the cervix and tamponing the uterus. His procedure is briefly as follows: dilating the cervix by means of a Hegar bougie and then tamponing. He then removes the tampon and dilates the cervix with a larger bougie followed by a tampon which is left in the cervix for forty-eight hours. The uterine contraction set up by this foreign body, in his opinion, makes for the development of the uterus. Forssner claims for this procedure 46 per cent of cures, 34 per cent greatly improved and only 20 per cent unrelieved.

The next surgical procedure to be considered is dilatation and curettage plus the use of some stem pessary. Crossen recommends the Baldwin glass

\*Presented before the monthly scientific meeting of the Swedish Hospital Staff, Minneapolis, Minn., December 7, 1922.

## DUDLEY OPERATION

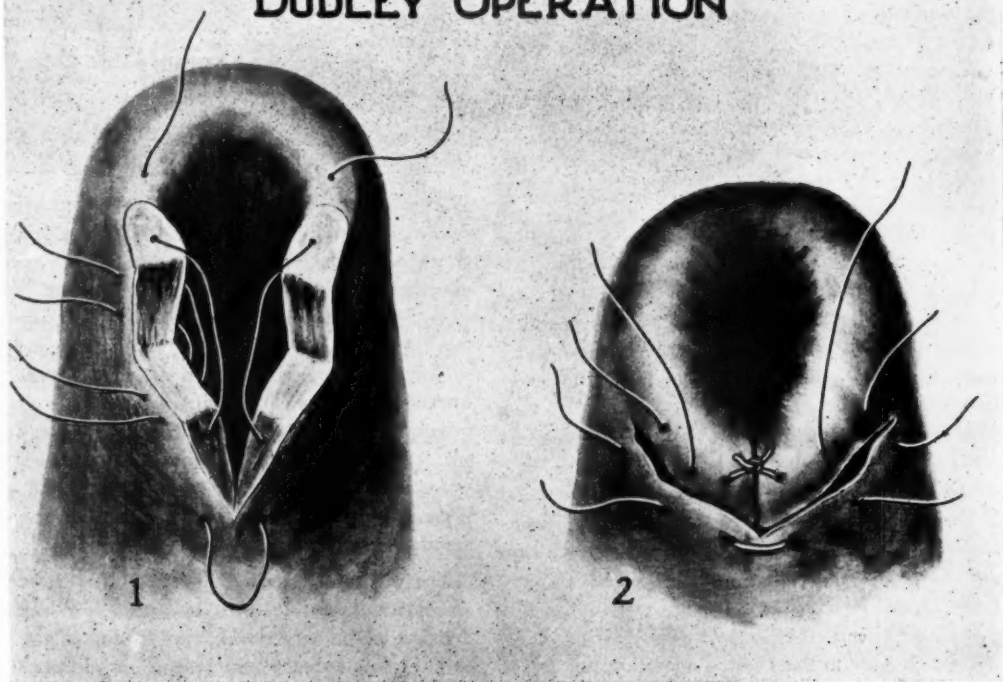


Fig. 1. Dudley operation from Crossen's "Operative Gynecology," 1917, showing posterior division made, wedge shaped piece removed and stitches in place.

Fig. 2. Dudley operation from Crossen's "Operative Gynecology," 1917, showing non-absorbable stitch tied and absorbable sutures ready for tying.

stem or the Dickinson hollow silver stem, both of which, when properly placed, lie entirely within the cervix. Stacy and Joseph increase their percentage of relief an additional 13 per cent by using the Baldwin stem as an addition to dilatation and curettage.

For the relief of dysmenorrhea caused by ante-flexion and retroflexion, the various surgical procedures are offered where the posterior or anterior segment of the uterus is divided for the purpose of relieving the obstruction and stenosis. These uterine operative procedures are more effective when supplemented by the removal of any other contributing pathological condition which may obtain at the time, for example, inflamed appendices, cysts of the tubes or ovaries, etc. Crossen warns against neglecting to remove contributory pathological conditions.

The first procedure for the relief of obstruction and stenosis was devised by Marion Sims.<sup>8</sup> This consisted merely of splitting the posterior segment of the uterus. The operation failed, however, in many instances because of the reuniting of the tissues divided and also because of the poor asepsis of that period, but the principle of dividing the cervical segment is the one used in the more recent procedures.

The Dudley operation (Figures 1 and 2), which was devised for the relief of pathological ante-flexion and its resulting obstruction and stenosis, was first published by Dudley in 1890 after having been used in eighteen cases. This procedure is well described by Dudley<sup>3</sup> himself in his 1902 edition, after his having done sixty more posterior divisions of the cervix. The technique of this operation is also well described by Crossen and is as follows: The cervix is grasped by a tenaculum, pulled down and the posterior segment split by means of a knife or scissors straight back, dividing the internal os. The two cut surfaces are then held apart and a wedge-shaped piece of tissue removed from both sides as shown in Figure 1. The sutures are then placed as shown in Figures 1 and 2 and, when tied, tend to shorten the posterior segment of the cervix, overcoming the ante-flexion and widening the canal, which overcomes the stenosis at the internal os. Dudley claims for this procedure seventy-five per cent relief.

Crossen adds to the Dudley operation the use of a stem pessary which he leaves within the canal until healing is complete.

## BELL OPERATION

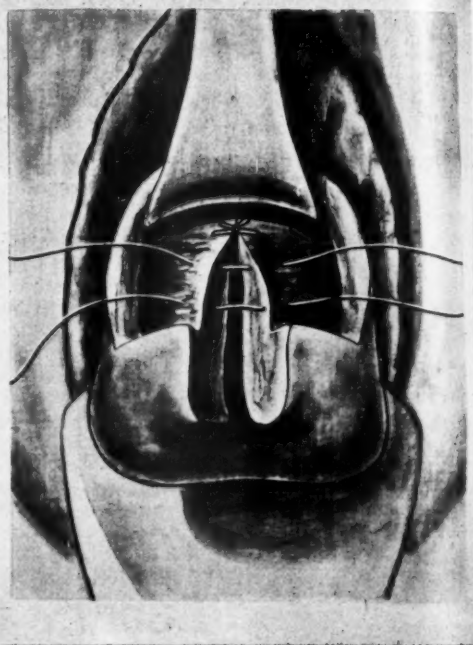


Fig. 3. Bell operation from Eden and Lockyear "New System of Gynecology," 1917, showing incision made and superficial sutures in position.

Graves<sup>6</sup> recommends some form of uterine suspension to accompany the Dudley operation.

Another very simple operative procedure offered is the anterior hysterotomy described by Bell.<sup>1</sup> A transverse incision is made through the vaginal covering of the posterior segment of the cervix (Fig. 3), which covering is reflected upward toward the bladder. A longitudinal incision is then made in the posterior cervical segment clear up to the internal os. The longitudinal incision is closed merely by superficial sutures, allowing the canal surface of this incision to remain open. The transverse incision is then closed. Bell claims a high percentage of relief and recommends this for either ante-flexion or retroflexion of the uterus.

The operation devised by Pozzi<sup>7</sup> for the relief of cervical stenosis, which operation is a bilateral division of the cervix with the cupping of the raw areas, gives to Stacy and Joseph an additional 20 per cent of relief. Crossen, however, claims that the relief obtained from this operation, when com-

bined with the curettage and dilatation, is due to the curettage and dilatation and in no part to the Pozzi operation.

One of the more recent operations devised for the relief of dysmenorrhea caused by pathological antelexion, is that of Jacob Frank.<sup>5</sup> This operation consists of splitting the posterior segment of the cervix to the internal os (Fig. 4) and hollowing out the tissue between the canal and vaginal surfaces of the cervix so that these two surfaces can be approximated readily by a continuous suture. This operation, like that of Dudley, opens up the canal, relieving the obstruction and stenosis. Frank claims this is applicable in cases of retroflexion as well as antelexion.

Following is a report of several Dudley operations performed by me within the last year:

*Case 1.* Miss W., age 26, housemaid, physically well developed, family history negative, came to me for an examination on February 5, 1921. She complained of extremely painful menstruations, necessitating her spending the day preceding her period, and the first day, in bed, and as she grew older the pain increased. She also complained of backaches and also pain in the lower abdomen, which was especially severe when standing on her feet a great deal. Patient began to menstruate at the age of sixteen, duration four and five days.

Physical examination revealed a small retroverted and immovable uterus. Patient was under my care for one year without relief from medication.

On January 6, 1922, the Dudley operation was performed. First menstruation postoperative early in September was very painful. Menstruations of March, April, May and June were painless. The July menstruation was painful the first day. The August and September menstruations were painless, but considerable pain attended the menstruations of October and November.

*Case 2.* Miss C., age 20, office assistant, family history negative, came to me for an examination on February 16, 1920, complaining of very painful menstruations, necessitating her spending several days in bed. Began to menstruate at the age of thirteen, duration two or three days.

Physical examination revealed extreme retroversion of uterus with an elongated cervix.

Patient was operated upon on March 6, 1920, the operation consisting of dilatation, curettage, Wylie's suspension, appendectomy, removal of cyst

of right ovary. First menstruation postoperative was extremely painful. The menstruations following for about six months were considerably less painful than before the operation, but patient felt very weak and would stay in bed for about a day at each period. After the first six months her menstrual periods again became very painful and no relief was obtained from medication.

On February 15, 1922, the Dudley operation was performed, since which time the patient has followed her previous employment and is entirely free from any menstrual disturbances.

*Case 3.* Miss E., age 24, stenographer, family history negative, came to me for an examination on August 27, 1922. Patient began to menstruate at age of sixteen and stated that her menstruations had always been very painful but were more severe during the last two and a half years, and especially so at night. She complained of being very nervous and had severe backaches especially when standing on feet.



Fig. 4. Frank operation from Frank's "Obstructive Dysmenorrhea and Sterility" showing posterior incision made and canal and vaginal surfaces approximated by continuous suture.

Physical examination revealed the uterus ante-flexed and cervix rather elongated.

On April 26, 1922, the Dudley operation was performed and the Wylie suspension. First menstruation postoperative, May 21st, was attended by slight pain the first hour. Practically no pain attended her menstrual periods of June and July.

Patient married and became pregnant. Missed menstruation of August. Patient aborted September 4th. The conditions following the abortion were generally good.

Patient's letter of December 4, 1922, states that her menstruation of November 8th was attended by very slight pain at first, and was less painful than any menstruation since her operation.

*Case 4.* Miss F., age 25, lives at home, family history negative, came to me for an examination on April 14, 1922. Patient began to menstruate at the age of fourteen, twenty-eight day type and of one week's duration. Menstruations have always been very painful, and patient complained also of frontal occipital headaches, saying she was seldom free from headaches.

Physical examination revealed uterus prolapsed and ante-flexed; dysmenorrhea. The patient was under care from August to November with no relief from medication.

On November 1st, the Dudley operation was performed; Wiley's suspension; appendectomy. The first menstruation postoperative was on November 13th, of four days' duration and absolutely painless. The December menstruation was also absolutely painless.

#### SUMMARY

No case of dysmenorrhea should be subjected to surgical work until careful, scientific attempts are made to relieve the condition by means of medication, glandular therapy and the general upbuilding of the patient.

The large percentage of cases of dysmenorrhea relieved by the simple procedure of dilatation of

the cervix with stimulating curettage of the uterus, justifies its being the first procedure attempted. It is many times the means of stimulating the uterus of the married woman so that she may become pregnant, pregnancy being the greatest cure of all for painful menstruation.

The relief obtained from the various operations previously described is by means of a division sufficient to overcome the obstruction and stenosis and the maintenance of that division. The principal function of the uterine suspension when added to one of these divisions, is to allow the uterus to receive its blood supply unobstructed and to keep the canal free from stenosis, and the advice of Graves in employing some form of uterine suspension is clinically worth following as my experience has been where a dilatation, curettage and suspension was done no relief was obtained until the Dudley operation was performed, and in cases where a Dudley operation was performed no relief was obtained until a suspension was done.

#### BIBLIOGRAPHY

1. Bell, W. Blair: *New System of Gynecology*. Eden and Lockyear, London, McMillan & Co., 1917, pp. 351-355.
2. Crossen, H. S.: *Operative Gynecology*. St. Louis, Mo., C. B. Mosby Co., 1917, pp. 508-517.
3. Dudley, E. C.: *The Principle and Practice of Gynecology*. New York and Philadelphia, Lee Bros. & Co., 1902, pp. 690-696.
4. Forssner, H.: *Operative Treatment of Dysmenorrhea*. Abstract Journal A. M. A., Vol. 77, Oct. 29, 1921, p. 1458.
5. Frank, Jacob: *Obstructive Dysmenorrhea and Sterility*. Chicago, Abstract Journal A. M. A., Vol. 70, April 6, 1918, pp. 985-986.
6. Graves, Wm. P.: *Graves Gynecology*. Philadelphia and London, W. B. Saunders Company, 1918, p. 696.
7. Pozzi: *Crossen, Operative Gynecology*. St. Louis, Mo., C. B. Mosby Co., 1917, pp. 515-516.
8. Sims, Marion: *Uterine Surgery*. New York, Wm. Wood Company, 1866, pp. 167-168.
9. Stacy, L. J., and Joseph E. G.: *Treatment of Dysmenorrhea*. Medical Clinics of North America, September, 1921, Vol. 5, pp. 473-476.

# MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,  
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN  
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-  
APOLIS SURGICAL SOCIETY

Owned and Published by  
The Minnesota State Medical Association.  
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE

R. E. FARR, M.D. H. LONGSTREET TAYLOR, M.D.  
Minneapolis St. Paul  
L. B. WILSON, M.D. F. L. ADAIR, M.D.  
Rochester Minneapolis  
J. T. CHRISTISON, M.D., St. Paul

## EDITORIAL OFFICE

CARL B. DRAKE, M.D., EDITOR  
403 Central Bank Bldg., St. Paul

## BUSINESS MANAGER

J. R. BRUCE, 402 Guardian Life Bldg., Saint Paul  
Telephone: Cedar 1683  
210 Commercial Bldg., Minneapolis  
Telephone: Atlantic 2716

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the journal itself, not to individuals.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Contents of this publication protected by copyright.

Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VI AUGUST, 1923 No. 8

## EDITORIAL

### The Todd Memorial Clinic

No man of the medical faculty of Minnesota was ever more beloved than was the late Frank Chisholm Todd. None brought to the faculty councils a more nicely balanced mind, a keener judgment, a surer sense of educational values, than he did. He was at once a good teacher, an excellent clinician and a capable administrator.

It was in his resourceful brain that the idea of graduate study in Minnesota first took form in the teaching fellowship.

He measured time by the headway one made. It was a trial to him in his last years—it would have been a growing aggravation to him had he lived—to await the slow movement toward University hospital extension and a better developed school. He thought always in terms of betterment.

He died in the war-service of his country. His command of the hospital at Camp Dodge was telling witness to his genius for organization. But the

war was only an incident of patriotic devotion in the story of his untimely ended life.

He died still thinking in terms of betterment for the school he loved. Among his private papers Mrs. Todd found, and entrusted to the interested study of his colleagues, memoranda indicative of his desire to contribute, out of his income or estate, toward the establishment of a permanent clinic in ophthalmology and otolaryngology. Details of the enterprise had taken shape in his mind and were outlined there. They sketched the skeleton upon which his large conception of usefulness to his profession was to be built.

Mrs. Todd proposed to set aside \$20,000 of his modest fortune toward such a memorial to him. Mrs. Edward C. Gale had already promised to add an equal sum to the fulfillment of his devoted purpose. It remained to his friends and colleagues and to the University, which owed him much, and of which he was alike an alumnus and a teacher, to enlarge this fund to suitable proportions to actualize the Todd Memorial Clinic.

"But the years are as waves that wash and wind,  
As careless waves that sweep the mind,  
And they creep like the grass,"

and slow, slow years they have been in bringing his purpose to the fulfillment it now promises to reach. To the gifts offered by his widow and his friend, Mrs. Gale, the University has found it possible at length to add \$110,000 toward the realization of the thing for which our friend, Frank Todd, planned. But while plans for the building, on this showing, are being made, it still remains true that the fund is insufficient to give to the University and to his memory the large monument appropriate to the occasion.

The Clinic is planned for fifty beds, but it should be planned also for the achievement of the highest results, in teaching and research and in human service, in Doctor Todd's chosen specialty. He meant it to be an instrument of progress. It was the inspired principle of the man that the status quo stands only for the basis of betterment. It is but the stepping-stone to higher things. The Clinic needs adequate plan, but it needs also endowment to enable it to "carry on" as its designer always did.

The writer suggests that the alumni of the Medical School see to it that it reaches at once the generous proportions that will insure its being the living, perpetuating, achieving thing he wanted it to be.

R. O. B.

### As Others See Us

It is extremely difficult for members of the medical profession to understand the attitude of the lay mind in relation to the art and science with which we are most concerned. While there is presented to the physician in bold relief an almost innumerable array of facts, a constantly increasing mass of incontrovertible evidence which goes to show how well founded and scientifically fortified, from the standpoint of achievement alone, modern medical practice is, it is most difficult for us to realize why the general public fails to a large degree in accepting our point of view.

The question arises—has not the medical profession individually and collectively failed to present the facts to the laity in assimilable form? To take the position that the lay public has not accepted the facts, as they actually are, because of lack of education or intelligence, is a mistake. Such well known authors as Upton Sinclair, Bernard Shaw and more recently John D. Barry, have, it would seem, ample opportunity of ascertaining the facts and yet Sinclair falls an easy prey to the wiles of one of the most colossal fakers known today. Bernard Shaw, likewise, while using terms of the most select English upbraids vivisection with a myriad of arguments, which to the trained physician are recognized as absurd and ludicrous.

More recently in the public press under the caption "Doctors and the Public," Mr. John D. Barry subjects us to a somewhat critical review. The well known conservatism of this writer and the facility with which he takes the reader into his confidence and attempts to disarm him by the subtle expedient of damning us with faint praise; the opportunity afforded such a writer to present his views, which he does in an exceedingly palatable form; the entire absence of any chance for those possessing the facts to dispute or correct his misconceptions and fallacious deductions—all serve to throw light upon the topic under discussion.

The last annual convention of the American Medical Association held in San Francisco seems to be the stimulus which brought from the facile pen of Mr. Barry some expressions regarding the medical profession which are apropos of the subject, "Doctors and the Public." He first compliments the newspapers (and this most justly) for the manner in which they handled the news of the convention. In considering the activities of the various sections, this writer's grasp upon the concept of our scientific

assembly, its hopes and ideals, the benefits to the public which inevitably result from the interchange of ideas and the relating of experience which take place in these assemblages, his appreciation of the effect of years of labor, industry and concentration in the field of practice and research made in the interest of the public is summed up in no uncertain terms when he states that "there was much talk but nothing done." To those of us who know what the widespread dissemination of knowledge through the medical profession means to the public the viewpoint of this writer will be difficult to understand.

Again the efforts of the medical profession to safeguard the interests of the public by more specifically defining the activities of the Red Cross (which by the way he seems to forget is a child of our own creation) are interpreted by him to mean that we fear the Red Cross as a business competitor. This writer's prediction that surgery will in the future become unnecessary by the influence of the mind upon the ductless glands expresses a hope with which all physicians will concur. Fortunately Mr. Barry momentarily drops the veil and makes one question his neutrality while offering the experience of an English speaker who was heckled by some medical students when delivering a tirade against vivisection in this country, a circumstance which he considers characteristic of the medical profession and an evidence of its intolerance.

The criticism by this writer and others as well as that of the general public is not without its bright side and his advice to us to seek assiduously the public confidence may well be listened to with the utmost respect. He calls attention to the fact that most great organizations employ publicity counsel and that this is essential to success. May not this point be worthy of serious consideration by the medical profession? Is it not time that we as a profession take the public into our confidence by the means that have been found most successful by other organizations and in doing so bring to our own ranks any credit we may deserve with benefits to the public which will many times multiply our own?

President Wilbur, of the American Medical Association, has recently stated his belief that the proper application of the knowledge possessed by the medical profession today would undoubtedly increase the average span of life at least ten years. Is not the method suggested by Mr. Barry the advisable one to pursue?

R. E. F.

## OBITUARY

### DR. JAMES L. LYNCH

Dr. James L. Lynch, a practicing physician in Winona for the past twenty-three years, died Wednesday, June 20, 1923, at his home in Winona at the age of fifty-eight.

Dr. Lynch was born in the town of Wiscoy, Minnesota, July 7, 1865, where he received his early education. He later attended the Winona Teachers College and subsequently taught school for several years in Winona County. Dr. Lynch received his medical training at the University of Michigan, where he was graduated from the medical school in 1900, coming directly to Winona to engage in the practice of medicine.

In 1908 Dr. Elizabeth Lynch became associated with her brother in practice and remained with him until her death in 1918.

Dr. Lynch had long been a member of the Winona County Medical Society and the State Association. As a student and practitioner he proved himself of unusual ability. Sound in judgment, a clear thinker and an ever ready friend in time of distress, he endeared himself to all those who had learned to rely on his professional service. In his death we have lost a valuable friend and fellow practitioner.

C. P. ROBBINS, M.D.

### DR. BURTON A. BAIRD

The death of Dr. Burton A. Baird, Prairie City, Iowa, formerly a fellow in surgery with the Mayo Foundation, Rochester, Minnesota, occurred July 7, 1923.

Dr. Baird was born in Prairie City, Iowa, September 14, 1891. He received his early education in his home city and in 1915 was graduated from the medical school of the State University of Iowa. His internship was served in the Montreal General Hospital from 1915 to 1917.

Dr. Baird became a fellow of the Mayo Foundation in 1918, later entering military service, from which he returned in 1921 with the rank of Captain. In December, 1921, he married Miss Beatrice Carroll of Bay City, Michigan, who survives him.

Early in 1922 ill health compelled Dr. Baird to give up his work at the clinic. Every effort was made on his part to regain his health but to no avail. His record, though a short one, shows that whatever he undertook was given his every thought and energy. His untimely death is a great loss and a matter of deep regret to the medical profession.

### DR. C. R. WARD

Dr. C. R. Ward, who practiced medicine for several years at Northome and later at Rose Creek, died at the St. Olaf Hospital in Austin, May 30, 1923, following a short illness, at the age of sixty-eight.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### MINNESOTA STATE MEDICAL ASSOCIATION

The next meeting of the Minnesota State Medical Association will be held in Saint Paul, Wednesday, Thursday and Friday, October 10, 11 and 12, 1923. The first day will be given to meetings of the Council and House of Delegates, with the second and third days devoted to the scientific program.

Those desiring further information concerning the meeting may communicate with the Secretary of the State Medical Association, 402 Guardian Life Bldg., Saint Paul, Minnesota.

### WABASHA COUNTY MEDICAL SOCIETY

The Wabasha County Medical Society held its annual meeting July 5, 1923, at Wabasha. Following are the officers for the ensuing year: President, Dr. W. H. Replogle, Wabasha; vice-president, Dr. H. E. Bowers, Lake City; secretary-treasurer, Dr. W. F. Wilson, Lake City. Dr. D. S. Fleischhauer of Lake City was elected delegate to the state convention, with Dr. E. H. Bayley of Lake City as alternate.

The program as presented included the following papers: President's address—"The General Practitioner and Public Health Work"—Dr. L. F. Sutton, Mazeppa.

"Treatment of Colitis"—Dr. G. Schmidt, Lake City.

"Practical Application of Epidemiological Observations of Epidemics of Influenza, Encephalitis, Poliomyelitis and Meningitis," with lantern slides—Dr. A. J. Chesley, Secretary State Board of Health, St. Paul.

"Lung Abscess Following Tonsillectomy"—Dr. D. S. Fleischhauer, Wabasha.

In connection with the meeting there was an exhibit of the work of the Division of Child Hygiene by the State Board of Health, under the direction of Miss Ruth Houlton, superintendent of Public Health Nursing.

At the business meeting, the following resolution was passed: "Whereas the methods of Dr. Albert Abrams have been shown to be a palpable fraud, and denounced by the American Medical Association, and

"Whereas, Abrams and his followers are bitter in their abuse of the regular medical profession, and of the regular medical societies; be it

"Resolved, by this society, that the pursuit of Abrams' methods by any member shall disqualify him for membership in this society."

### REDWOOD-BROWN COUNTY MEDICAL SOCIETY

The Redwood-Brown County Medical Society held its annual meeting in Riverside Park at Springfield, June 15, 1923. The following officers were elected for the ensuing year: President, Dr. H. M. Juergens, Sanborn; vice-president, Dr. J. Adams, Morgan; secretary-treasurer, Dr. William A. Meierding, Springfield. Dr. J. Shrader of Springfield was elected delegate to the state association meeting, with Dr. J. Adams of Morgan as alternate.

## OF GENERAL INTEREST

Dr. R. I. Stewart, formerly of Wendell, is now located at Lindstrom.

Dr. P. A. Schmidt, lately of Renville and Remer, is now located at Mapleton.

Dr. Fred Selle has closed his practice at Winthrop and will locate in Milwaukee, Wisconsin.

Dr. C. H. Sherman has disposed of his practice at Marine-on-the-St. Croix and has located at Bayport.

Dr. P. J. Griffin, formerly of Fertile, has moved to Detroit, Minnesota, where he will continue his practice.

Dr. E. J. Borgesen, Hanska, recently returned from a two weeks' trip through northern Minnesota.

Dr. O. A. Oredson of Duluth has been appointed head of the free municipal clinic at St. Mary's Hospital.

Dr. A. E. Lange of Rochester has moved to Walla Walla, Washington, where he has taken up his practice.

Dr. John T. Bowers recently became a member of the staff of the Physicians' Hospital at Thief River Falls.

Dr. Millard C. Hanson, a graduate of Rush Medical College, recently opened a medical practice at Breckenridge.

Dr. H. A. Hartung of Le Sueur recently returned from Chicago, where he completed a course in post-graduate work.

Dr. L. E. Nelson of Minneapolis has recently become associated with Dr. J. C. Jensen in his practice at Hendricks.

Dr. C. T. Ekelund, formerly of New Ulm, is now located at Hibbing, where he is a member of the staff of Rood Hospital.

Dr. I. J. Murphy, Minneapolis, has been appointed to supervise x-ray treatments for ex-service men of the 10th District.

Dr. A. G. Churchill, formerly of St. Paul, is now engaged in surgical work at the Great Lakes Naval Hospital, Great Lakes, Illinois.

Dr. and Mrs. R. G. Hassett, formerly of Minneapolis, are now located at Bird Island, where Dr. Hassett will open a medical practice.

Dr. A. A. Rankin, Waconia, has purchased the practice of Dr. H. D. Diessner, who is leaving Waconia to take up special work in Chicago.

Dr. Harold LeRoy Goss has announced the opening of his offices at 910 Donaldson Building, Minneapolis, for the practice of ophthalmology.

Dr. C. G. Quammen of Delavan sailed last month for a visit to his former home in Norway. Dr. Quammen will return in about six months.

The marriage of Dr. S. P. McDaniel of Mountain Iron to Miss Golda Rader, Manhattan, Kansas, was solemnized at Duluth, Saturday, June 16.

Dr. C. M. Smith, formerly of Coleraine, is now associated in the practice of medicine with Dr. S. H. Boyer and Dr. A. J. Braden at Duluth.

Dr. L. L. Hardt has resigned his position in the Mayo Clinic, Rochester, to take charge of the medical work in the Sheridan Clinic of Chicago.

Dr. Chester J. Sturges, who recently completed his internship in a Nebraska hospital, is now associated in practice with Dr. J. J. Catlin of Buffalo.

Dr. J. I. Mitchell, who has been a member of the Mayo Clinic, Rochester, for the past four years, is now associated with the Campbell Clinic, Memphis, Tennessee.

Dr. Thomas Lowe, Jr., who has been associated with the Home Hospital at Slayton for the past year, has resigned his position and will locate at Gibbon for private practice.

Dr. and Mrs. E. H. Nelson and daughters, Lucile and Marjorie, have returned from a three weeks' trip on the Great Lakes to Buffalo, New York, and other eastern points.

Dr. and Mrs. Francis B. Kingsbury and family of Minneapolis have gone East, where Dr. Kingsbury will continue the practice of medicine. They will make their home in New York City.

Dr. Oliver C. Melson and Dr. William McK. Craig of Rochester recently returned from a trip to California, returning by way of the Canadian Rockies, stopping at Lake Louise and Banff.

Dr. L. B. Wilson, Rochester, has been appointed a member of the Council on Education of the American Medical Association, replacing Dr. Ray Wilbur, who is now president of the association.

Announcement has been received of the marriage of Dr. A. T. Farisy of Fairfax to Miss Irene Poss of Franklin, which occurred at Franklin, June 26, 1923. Dr. and Mrs. Farisy are now at home in Fairfax.

Word has been received of the marriage of Dr. Irene Neumeyer of Minneapolis to Dr. Percy L. Owens of Buffalo, N. D. Both Dr. and Mrs. Owens are graduates of the University of Minnesota Medical School.

Dr. H. O. Skinner and family of Saint Paul have returned from a two months' motor trip in the East. At Atlantic City, Dr. Skinner attended the American Institute of Homeopathy, before which he read a paper on "Pneumonia in Children."

Dr. Sam Solhaug has announced the opening of offices in the Donaldson Building, Minneapolis, for the practice of medicine. Dr. Solhaug recently received the degree of Ph.D. from the University of Minnesota, where he completed his medical course in 1917.

Dr. G. C. Morehouse of Owatonna was elected secretary of the tri-county tuberculosis sanatorium commission, which will supervise the erection and affairs of a proposed \$100,000 sanatorium for tuberculous patients of Steele, Freeborn and Faribault counties, at the first meeting of the body held in Albert Lea in June.

Thomas Hospital, Minneapolis, which during the past two years has been devoted to the care of the veterans suffering from tuberculosis, will now be made available to private patients. This has become possible because of the present policy of the Government to discontinue the use of contract hospitals.

Dr. Joseph Nicholson was re-elected president of the Northwestern Medical and Surgical Association at its annual meeting held at Brainerd, June 12. Dr. Nicholson has established a general hospital known as the Northwestern Hospital in Brainerd. He received his degree in 1903 at the University of Minnesota and has practiced in Brainerd since graduation.

Dr. S. Marx White and his daughter, Miss Betty White, returned in July from a trip through the Yosemite National and Glacier National parks. While in California Dr. White and Miss White were the guests for a day of Dr. and Mrs. Ernest Mariette at Carmel-by-the-Sea. Dr. and Mrs. Mariette, who were married June 9 at the home of Mrs. Mariette's parents, Mr. and Mrs. David P. Jones, Minneapolis, went to California on their wedding trip.

William Henry Eustis, former mayor of Minneapolis, has presented the University with a million dollar gift. The gift includes a forty-four acre tract of land on the Minneapolis side of the Mississippi River, about a mile above the government dam, where a convalescent home, providing for 250 children suffering from orthopedic conditions, will be erected. Provision is also made for a fifty-bed orthopedic hospital to be a part of the University hospital system, which will probably be erected on the campus. Children will be eligible to treatment whether their parents are able to pay a fee or not.

Adjoining the tract on the river, Mr. Eustis has already presented to the city of Minneapolis a site for the Dowling School for Crippled Children, a memorial to the late Michael Dowling, an Olivia banker.

County commissioners in Minnesota have been allotted the duties formerly given judges of probate, of signing certificates of admission to the University of Minnesota Hospital at Minneapolis for residents of a county who in their judgment require treatment at that institution.

Dr. L. B. Baldwin, superintendent of the hospital, has sent out an announcement calling the change in law to the attention of county commissioners.

The original law, passed by the 1921 legislature, provided that a judge of probate should sign the certificate, following receipt of a physician's recommendation. The only change made by an amendment which the recent legislature passed is to give each commissioner the duty of signing this certificate for patients residing in his district in the county.

When patients are sent from Minnesota counties to the University of Minnesota Hospital under the amended law the state meets half of the expense, the cost to the county being reduced by an equivalent amount.

Dr. Baldwin called attention to the fact that the report of the doctors' examination must accompany all applications for admission signed by the county commissioners.

## NEW AND NON-OFFICIAL REMEDIES

In addition to the articles enumerated in our July issue, the following articles have been accepted:

### ABBOTT LABORATORIES:

Amidopyrine-Abbott Tablets, 5 grains.

Epinephrin Chloride Solution-Abbott.

### GENERAL CHEMICAL CO.:

Sofos.

### ELI LILLY & Co.:

Iletin (Insulin-Lilly), H-10:5 c.c. ampules; H-20:5 c.c. ampules.

### POWERS-WEIGHTMAN-ROSENGARTEN CO.:

Sulpharsphenamine Billon, 0.1 gm. ampules; 0.2 gm. ampules; 0.3 gm. ampules; 0.4 gm. ampules; 0.5 gm. ampules; 0.6 gm. ampules.

**Insulin.**—An aqueous solution of an active principle from pancreas which effects sugar combustion. The strength of insulin is expressed in "units," one unit being one-third of the amount required to lower the blood sugar below 0.045 per cent and cause convulsions in a rabbit weighing 2 kg. which has been previously starved for twenty-four hours. The administration of insulin to diabetic dogs and to man in severe cases of diabetes mellitus restores to the body the lost ability to oxidize carbohydrate, and glycogen is again stored in the liver. If insulin is administered at suitable intervals to a person suffering from diabetes mellitus, the blood sugar is maintained at a normal level and the urine remains free of sugar. Fat is also burned and, as a result, ketone bodies do not appear in the urine and diabetic acidosis and coma are prevented. The administration of insulin is indicated in cases of diabetes mellitus which cannot be controlled satisfactorily by dietetic treatment. Overdosage of insulin is followed by the development of serious symptoms which demand immediate treatment. Insulin is administered subcutaneously one, two or three times a day before meals. The dosage required to reduce the blood sugar to the normal level must be established for each patient by determination of the blood sugar before and after administration of insulin. In cases of coma or severe acidosis, an initial dose of 15 or 20 units of insulin may be given, followed at three to four hour intervals by smaller doses with simultaneous administration of glucose.

**Insulin-Toronto.**—A brand of insulin. It is marketed in 5 c.c. vials containing 10 units in each c.c., and in 5 c.c. vials containing 20 units in each c.c. Connaught Antitoxin Laboratories of the University of Toronto, Toronto, Ontario, Canada.

**Quinine Ethyl Carbonate.**—The quinine ester of ethyl carbonic acid. Quinine ethyl carbonate was first introduced as euquinine. It is used in place of quinine sulphate and similar soluble quinine salts when a practically tasteless quinine compound is preferred.

**Quinine Ethyl Carbonate-M.C.W.**—A brand of quinine ethyl carbonate-N. N. R. Mallinckrodt Chemical Works, St. Louis, Mo. (Jour. A. M. A., June 2, 1923, p. 1617.)

**Arsphenamine-Mallinckrodt.**—A brand of arsphenamine-N. N. R. (see New and Non-official Remedies, 1923, p. 46). It is marketed in ampules containing, respectively, 0.1 gm., 0.2 gm., 0.3 gm., 0.4 gm., 0.5 gm., 0.6 gm. and 1.0 gm. Mallinckrodt Chemical Works, St. Louis, Mo.

**Barbital-M. C. W.**—A brand of barbital-N. N. R. (see New and Non-official Remedies, 1923, p. 62). Mallinckrodt Chemical Works, St. Louis, Mo.

**Cinchophen-M. C. W.**—A brand of cinchophen-N. N. R. (see New and Non-official Remedies, 1923, p. 90). Mallinckrodt Chemical Works, St. Louis, Mo.

**Mercuric Cyanide-M. C. W.**—A brand of mercuric cyanide-N. N. R. (see New and Non-official Remedies, 1923, p. 194). Mallinckrodt Chemical Works, St. Louis, Mo. (Jour. A. M. A., June 16, 1923, p. 1775.)

**Iletin (Insulin-Lilly).**—A brand of insulin (see Jour. A. M. A., June 2, 1923, p. 1617). It is marketed in 5 c.c. ampules containing 10 units in each c.c., and in 5 c.c. ampules containing 20 units in each c.c. Eli Lilly & Co., Indianapolis, Ind. (Jour. A. M. A., June 23, 1923, p. 1851.)

**Amidopyrine-Abbott.**—A brand of amidopyrine-N. N. R. (see New and Non-official Remedies, 1923, p. 250). It is marketed in substance and in 5 grain tablets. Abbott Laboratories, Chicago, Ill.

**Epinephrine Chloride Solution-Abbott.**—A solution containing epinephrine chloride, equivalent to 1 part of epinephrine in 1,000 parts of physiological solution of sodium chloride, preserved by the addition of benzoic acid and saturation with carbon dioxide. For a discussion of the actions, uses and dosage of epinephrine, see New and Non-official Remedies, 1923, p. 112. Abbott Laboratories, Chicago, Ill. (Jour. A. M. A., June 30, 1923, p. 1910.)

#### PROPAGANDA FOR REFORM

**Calcium Therapy in Tuberculosis.**—From a review of the literature, Mayer and Wells concluded that there is no convincing clinical evidence of the value of calcium administration in tuberculosis. They believe that no deficiency in blood calcium exists in tuberculous patients. From carefully controlled animal experiments these investigators conclude that calcium administration does not affect the course of tuberculosis in animals. If the use of calcium compounds in the treatment of tuberculosis is to be continued, clinical experiments of a scientific character should be conducted. At the present time there appears to be no scientific basis for the use of calcium in tuberculosis. (Jour. A. M. A., June 2, 1923, p. 1619.)

**Progress and Conservatism in Therapeutics.**—The Committee on Therapeutics of the Council on Pharmacy and Chemistry has published a communication calling attention to two books which physicians should have—New and Non-official Remedies and Useful Drugs. It is explained by the committee that for eighteen years the Council has done its utmost to bring before the medical profession the truth concerning the new proprietary medicinal preparations which are being offered to the profession. The work and functions of the Council are discussed, and it is explained that while the Council was organized primarily to put a stop to the exploitation of proprietary medicines under false claims and the use of secret preparations, its activi-

ties have broadened until its work may now be characterized as a "propaganda for the rational use of drugs." The communication concludes: "New and Non-official Remedies" and "Useful Drugs" together furnish information concerning all drugs, old and new, which are at present essential to, or give promise of value in, the practice of medicine. They have been compiled with a special object in view, namely, to meet the needs of the student and practitioner of today. The report is signed by C. W. Edmunds, M.D., Professor of Materia Medica and Therapeutics, University of Michigan, Ann Arbor, Mich.; John Howland, M.D., Professor of Pediatrics, Johns Hopkins University, Department of Medicine, Baltimore, Md.; Ernest E. Irons, M.D., Ph.D., Associate Professor of Medicine, Rush Medical College, Chicago, Ill.; W. T. Longcope, A.B., M.D., Professor of Medicine, Johns Hopkins University, Department of Medicine, Baltimore, Md.; G. W. McCoy, M.D., Director Hygienic Laboratory, U. S. Public Health Service, Washington, D. C.; W. W. Palmer, B.S., M.D., Bard Professor of Medicine, College of Physicians and Surgeons, Columbia University, New York City; Francis W. Peabody, M.D., Professor of Medicine, Medical School of Harvard University, Boston, Mass.; L. G. Rowntree, M.D., Sc.D., Professor of Medicine, Mayo Foundation, Rochester, Minn. (Jour. A. M. A., June 2, 1923, p. 1635.)

**More Misbranded Nostrums.**—The following preparations have been the subject of prosecution by the federal authorities charged with the enforcement of the Food and Drugs Act: Woods V. Tabules (Edward J. Woods), containing zinc phosphid, strychnin and plant extractives. Lukosine (National Drug Co.), a powder containing approximately 80 per cent of boric acid and small proportions of zinc sulphate, alum and a salicylate, and traces of alkaloid, phenol, thymol and menthol. Eckman's Alternative (Burrrows-Little-White Co.), consisting essentially of 94.4 per cent of water flavored with clove oil, 3.3 per cent of calcium chlorid and 2.3 per cent of plant extracts. Gombault's Caustic Balsam (Lawrence-Williams Co.), a mixture of a fatty oil with approximately 20 per cent by volume of oil of turpentine. McGraw's Oil of Life (McGraw Remedy Co.), consisting approximately of 95 per cent of kerosene and small proportions of turpentine oil, tar oil and camphor. Vital Sparks (Hollander-Koshland Co.), gelatin capsules containing a fatty oil, colored red, and a sugar-coated pill of zinc phosphid, damiana and strychnin. Mydyl Antiseptic Wafers (Chas. S. Ruckstuhl), composed of borax and starch. Syrup Leptinol (Balsamea Co.), consisting of *Lepiotaena dissecta* (a plant belonging to the *parsnip* family), sugar, glycerin, alcohol and water. Sangvin (Dr. M. Spiegel & Sons), composed essentially of plant drugs, including a laxative drug, sugar, alcohol, glycerin and water. Peterson's Ointment (Peterson's Ointment Co., Inc.), a petrolatum ointment containing zinc oxid, tannin, phenol and camphor. (Jour. A. M. A., June 9, 1923, p. 1710.)

**Cod Liver Oil in Tuberculosis.**—Experiments carried out in the Hygienic Laboratory of the U. S. Public Health Service to determine the effect of cod liver oil on the tuberculosis of the guinea-pig failed to show any definitely beneficial effects. There was no evidence of the deposition of calcium when this element was administered along with the cod liver oil. These results warn against unwarranted optimism and justify critical investigation whenever cal-

cium or cod liver oil are lauded as a specific in tuberculosis. (Jour. A. M. A., June 16, 1923, p. 1778.)

**Peptone in the Treatment of Migraine.**—The Council on Pharmacy and Chemistry publishes a preliminary report on the experimental status of the use of peptone in the treatment of migraine. Drs. Joseph L. Miller and B. O. Raulston report that the intravenous administration of peptonum-siccum-Armour brought about improvement in a considerable number of cases. The Council points out that commercial peptones are heterogeneous mixtures of uncertain composition, and that the results reported may have been due to tissue impurities rather than to peptone itself. It is, therefore, evident that the reported results cannot be made the basis for a rational treatment of migraine. Peptonum Siccum is stated by Armour & Co. to contain 90 per cent of protein. Seventy per cent of the protein content is in the form of peptone and secondary proteoses, while the remaining 30 per cent is in the form of amino-acids. Those who wish to make experiments with peptone in the treatment of migraine should use the particular peptone used by Miller and Raulston, or one which has an essentially similar composition. (Jour. A. M. A., June 30, 1923, p. 1910.)

## TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD FEBRUARY 8, 1923

THE PRESIDENT, DR. R. C. WEBB, IN THE CHAIR

### THE VALUE OF SURGICAL TREATMENT OF ACUTE HEAD INJURIES

DR. A. W. ADSON OF ROCHESTER, MINNESOTA

In view of the numerous automobile accidents, head injuries are becoming more frequent and necessarily more attention must be given to the treatment of these various injuries. Although exploration and decompression is definitely indicated in a large group of patients suffering from such conditions, surgery is often contra-indicated.

There are those patients who have suffered an injury to the head without fracture of the skull and with concussion, but without symptoms of compression. Such patients should be placed in bed, observed closely, have repeated spinal punctures if there is evidence of increased intracranial pressure due to edema, and if at any time there are indications of a progressive lesion, an exploration is then justified.

Another group comprises those patients who have fractures of the skull and who are unconscious, with symptoms of concussion and with mild symptoms of compression. If the fracture is a comminuted one, it should be taken care of, first by removal of any foreign bodies or fragments of bone and control of hemorrhage. If the fracture involves the base, repeated spinal punctures are advantageous, but if the patient remains unconscious after a few hours, and particularly if respiration and the pulse becomes more labored, a decompression and exploration should be performed. Usually a right decompression is the one of choice, but if there are cerebellar symptoms, occasionally a cere-

bellar exploration is indicated. It is very urgent, of course, that measures be instituted without unnecessary delay, since very little can be accomplished if the patient is in extremis.

The third group consists of those patients who are seen in a critical condition, having marked symptoms of cerebellar compression with stertorous breathing, slow pulse and high blood pressure, resulting from very severe injuries. Occasionally an operation is of value, but too frequently surgery is useless in treating these cases. It is questionable whether it is advisable to do anything more than in the way of repeated spinal punctures and treatment of the local injury. The administration of intravenous hypertonic salt solution is of some value if there is plenty of fluid in the ventricles, but is of no value if the ventricles are compressed by cerebral edema. Decompressions or explorations can ordinarily be performed under local anesthesia and these procedures should be employed if repeated spinal drainage fails to give relief; surgery should be instituted sufficiently early to prevent progression of symptoms, but should not be undertaken in the case of a patient with only slight injuries nor in the cases of patients whose symptoms can be controlled by spinal punctures; neither should they be instituted when the patient's symptoms are slight, as such procedures in themselves have a sequela in the form of functional disorders. One must bear in mind always the possibility of an extra-dural hemorrhage and, while the symptoms may be few and not severe, there is danger on the second and third day of developing compression symptoms. Whenever there is evidence of a localized lesion it is well to explore the patient.

Head injury patients should be kept under observation for a year or two after the injury occurred; by this I do not mean that they must necessarily be seen at frequent intervals, but they should be seen often enough to emphasize the necessity of avoiding strenuous mental activities, and of having plenty of recreation, to administer nerve sedatives, to advise relative to the possibility of nervous phenomena; and most important is the necessity of encouraging the patient to believe that he will recover. It is quite impossible at the time of injury to forecast which patients may develop epilepsy, neurosis, or psychosis; if, however, the patient is properly advised and directed, many of the subsequent complications sometimes following injuries of this nature can be avoided.

As a rule very little is accomplished by filling skull defects; occasionally such measures are necessary for cosmetic reasons and sometimes there is a definite irritation which indicates filling the defect; if this be true, a bone plate gives better results than the celluloid or silver plate. If the defect is over the vertex or parietal region, a celluloid plate can sometimes be used, but too much benefit should not be promised following such closures. Although we should warn the patients relative to assuming too much mental responsibility, still encouragements in the way of resuming their regular duties in moderation as soon as possible should be given to avoid making invalids of this type of patient.

#### RESUME

Thorough diagnostic measures should be employed in arriving at a definite conclusion as to the diagnosis of head injuries, and if it is decided to operate on the patient, this

should be done as soon as the shock has been treated, performing the operation with the patient under a local anesthetic and before marked symptoms of compression have developed.

**DR. ARTHUR A. LAW:** Dr. Adson has so thoroughly covered every point relative to acute head injuries that he has stolen the thunder of most of those who wish to discuss his masterly paper. One or two points occur to me which I simply wish to discuss to give added emphasis to his admonition.

First, I am sure the profession is prone to make light of many head injuries. In looking back over a period of over thirty years' experience I am impressed by the number of serious head injuries which were picked up after a preliminary survey which seemed to indicate that the injuries were trivial. We like to quote to our students Murphy's assertion that he personally would rather be dead than be struck on the head and rendered unconscious for a few moments, explaining this by saying as Dr. Adson so ably stated that we never know the end result of a head injury. We would wish to emphasize the necessity of careful stereoscopic x-ray studies of every head injury. Only by such adjuncts to diagnosis can we pick up the obscure fracture cases which cannot be diagnosed in any other way. Again may I emphasize that we should be careful and guarded in giving our prognosis in any head injury. In reporting to corporations, report to the effect that you are unable to prognosticate what the end result of this injury will be. I would call your attention to the constantly increasing reports from centers where much industrial or traumatic head surgery is done, to the effect that good results are being obtained by the relief of intracranial pressure through decompression. I do not wish to be understood as advocating decompression unless it is indicated. I do wish to be understood as affirming, however, that this measure is not resorted to as often as it should be.

**DR. J. FRANK CORBETT:** Spinal puncture is a procedure I wish to discuss in fullest detail. Dr. Hirschfeld has collected data from twenty-five skull fractures in my service that I will use as illustrations. With Dr. Hirschfeld I made a careful study and analysis of twenty-five severe head injuries. These cases gave evidence of severe laceration of the brain. The spinal fluid in all was blood stained for a period of time. Choked disc did not occur in any, but so far as our records go there were changes indicative of increased intracranial pressure in that there was blurring of the nasal half of the disc. These cases gave one the general impression of edema of the brain. They were treated with repeated spinal punctures, making it the rule to reduce the spinal pressure to normal limits as often as was thought best in each case. The cases in this series were unusually severe. Of the basal fractures, three showed loss of light reaction and two reacted. Of the vault all gave light reaction. Of the basal and vault fractures nine gave no reaction to light and five gave reaction. Of all cases that gave no reaction to light, death ensued in six cases and six recovered. There was inequality of pupils in two basal fractures, in one vault fracture and six basal and vault. There was paralysis of extra ocular movements in three of the basal fractures, in none of the vault fractures and in six of the basal and vault fractures. In these, internal

strabismus was reported once and external strabismus twice. The pupils were contracted in four of the basal and vault fractures. In three basal and vault fractures the pupils were of normal size. One case had irregular pupils due to syphilis that was discovered at autopsy. The eye findings gave one a good index to the grade of severity of these cases. At one time it was thought that loss of light reaction in a basal fracture indicated a fatal prognosis. There is definite bleeding from the ears recorded in none of these cases. Of the basal cases one died and two recovered. Of the vault cases there were two deaths and four recovered, while in the basal and vault there occurred six deaths and ten recoveries. Total deaths, nine; recoveries, sixteen.

The cause of death was as follows: Meningitis in one operated case of vault fracture; in two operated cases of basal and vault fracture; in two non-operated basal and vault, and in one non-operated basal. Shock, two cases. Hemorrhage, one case. Death from hemorrhage, shock and meningitis, nine. This seems to leave no deaths from brain edema, usually a prolific cause.

The condition on admission was as follows: Deep coma occurred thirteen times, distributed as follows: basal and vault, eight; vault, three. Semi-coma occurred ten times, distributed as follows: Vault, two; vault and basal, six; basal, two. Intermittent coma and semi-coma in one vault and basal fracture. Of incidental interest is the occurrence of a positive Babinski with no associated or later paralysis. These included two vault fractures, one of which was blind for twelve hours; three basal and vault fractures, of which one had Jacksonian attacks, and one basal. Paralysis of the seventh and eighth nerves occurred twice.

The relation to brain injury and edema is shown to some degree by the spinal manometer reading. The average reading was 11 mm. of mercury when this was done within three hours after the accident. In one instance this was 16 mm., which was the highest. There was one case not included in the above average where the manometer registered 21 almost immediately after the accident. In this case there was no blood in the spinal fluid, but there was an enormous depressed fracture. The pressure was 15 mm. in this case at the end of twenty-four hours. Even the cases in profound coma on admission did not show any increase above what has been given. Some of these cases improved at the end of twenty-four hours, but among those that got worse there were five, and in these the average pressure was 25. That is, edema had been added to original trauma. In addition, in one case edema was delayed and showed a maximum as indicated by spinal reading of 28 in three days. With all cases the average manometer reading was 17.1 at the end of twenty-four hours. Of these cases Case 5253 was most striking. This man was injured at 9 a. m. and his mind was clear at 1:59 p. m. He became slightly drowsy and almost comatose at 5 p. m. His manometer reading at 5 p. m. was 23. He immediately cleared after puncture and his reading remained at 16.

Coma may exist as a result of the brain trauma without increased intra-spinal tension, but the usual subsequent occurrence of edema is apt to complicate the condition by further increasing intracranial tension. Edema has never been very evident before eight hours after accident. There

fore, early spinal puncture is not advisable unless there is special reason for it.

Dr. J. F. CORBETT presented two neurologic cases as follows:

#### CEREBRAL TUMOR

A male, aged 30, was admitted to the hospital January 10, 1923. The past history was essentially negative. The patient finished grade school at fourteen and then went to work as a common laborer and mechanic. The general history is practically negative as taken by assistants. At present patient has hallucinations in which he sees angels, the Deity, etc. Delirium is also present to the effect that a man who committed suicide did this because of an argument he had had with patient.

**Complaints:** Headache, frontal in type, and also pain in the upper cervical region; duration two months, constant in character with occasional remission for two or three hours. Very severe headache two or three times a day, lasting for several minutes, causing patient to cry and groan. Pain in both ears past four or five weeks. Pain steady in character and not particularly severe. No impairment of hearing and no running ears. Vomited four or five times during the last four days. No diplopia or visual disturbance, but tires easily when attempting to read.

On examination patient was found to be well developed and fairly nourished. Patient has periods of drowsiness in which he lies quietly in bed, and occasionally periods of irritability when he complains of excruciating headache. His pulse rate was 50 and his temperature 98. His head was entirely negative. He had very marked bilateral choked disks and his vision was very markedly impaired. His right pupil was slightly larger than the left. Both pupils were slightly irregular and reacted sluggishly to light and sustained their constriction very poorly. There was a small ulcer on the right cornea. The blood pressure was 118—60. The chest and heart were normal. The abdominal reflexes were slightly exaggerated, both upper and lower, the patellar being slightly more active on the right side than on the left. There was a questionable right Babinski, the left negative. All modifications of Babinski negative. There was a questionable ankle clonus on the right side, negative on the left. The joint sense of the great and second toes (both feet) was apparently markedly impaired. The legs could not be extended on the flexed thigh over an angle of 100 degrees.

On January 20, 1923, an operation was performed. A spinal puncture needle was introduced into the posterior horn of the right ventricle. The needle was introduced 4 cm. above the superior curved line and 2 cm. beyond the middle line. It was introduced in an upward and outward direction. Cerebrospinal fluid was found at a depth corresponding to nearly the entire length of the spinal puncture needle. Thirty-five c.c. of cerebrospinal fluid was withdrawn and 35 c.c. of air injected to take its place. The air had to be introduced under considerable pressure.

On January 26, 1923, a second operation was performed. An osteoplastic flap was made in the temporo-parietal region and its center removed for the purpose of decompression. No fluid was obtained by puncturing the ventricle. The brain bulged forward but no tumor was visualized although infiltrating tumor tissue was felt with a Cushing stilette.

The ventriculogram showed a single normal ventricle and complete obliteration of the opposite one. This predicted a tumor mass in the neighborhood of the ventricle. This was confirmed at operation.

The flap was brought into place with chromic catgut and silk worm sutures.

#### INJURY OF FOURTH AND FIFTH CERVICAL NERVES

The patient, a male, aged 60, was knocked off a scaffold at 11 a.m., August 5, 1922. He stated that he was struck in the upper part of the back. He at once noticed numbness in his legs and arms and inability to move same. At 1 p.m. of the same day there was a spastic paralysis of both arms and legs with a positive bilateral Babinski. At 3:30 p.m. he could move the toes of his left foot. At 5 p.m. he was able to flex the left knee slightly.

August 6, 1922, he had all motions in his left lower extremity with a bilateral Babinski and negative abdominal reflexes.

In view of the paralysis of the upper extremities and lack of abdominal breathing it seemed the lesion was in the region of the fourth and fifth cervical nerves. The patient could not void urine and catheterization was necessary. The next day he was able to move his left leg more freely and void urine. Two days later he could move the right leg slightly, also the left hand, but he had to be catheterized.

August 11, 1922, had inability to control his bowels. Three days later he was able to move his left leg well and the right leg slightly. He could move all the fingers of the left hand and the left forearm slightly.

August 20, 1922, he again had retention of urine. September 6, 1922, he could move both lower extremities well and was able to move all of the left side up to the face. September 11, 1922, he was allowed up in a wheel chair an hour and one-half each day.

January 2, 1923, Dr. Angus Morrison's examination disclosed abdominal reflexes not obtained, positive bilateral Babinski, pin prick acutely felt all over skin surface, deep reflexes markedly exaggerated on both sides and ability of patient to perform all movements of the left arm and leg, the movements of the right arm and leg being distinctly limited.

There was flaccid paralysis in the distribution of the fourth and fifth motor roots of the cervical plexus on the right side. There was voluntary motion elsewhere, but all the muscles except those recorded as flaccid showed spasticity. There was a picture of both an upper motor neurone lesion and a lower motor lesion from a single injury.

#### TRAUMATIC WOUND OF THE KNEE JOINT WITH FOREIGN

##### MATERIAL IN THE JOINT

Dr. R. C. WEBB presented a man 41 years of age, who was injured five months previously while getting off a moving train. His right knee joint was torn open, presenting a transverse wound 4 inches long at the proximal edge of the patella on the anterior surface of the thigh. The quadriceps tendon was torn from the patellar base or proximal portion, exposing the bony surface in the proximal fourth of the anterior surface of the patella, and the synovial capsule was torn from its attachment at the cartilaginous articular surface of the proximal or superior fourth of the patellar circumference. The wound was dirty and ragged

and ground with dirt and debris and there were cinders in the knee joint.

In addition to this wound there were other wounds. His left leg had been nearly amputated by the car wheels just below the middle of the leg and was hanging by a few tendons. There were two scalp lacerations. There was a large wound 6 inches long over the great trochanter of the right femur which extended over the upper end of the femur and down to the region of the femoral neck.

He was brought to St. Mary's Hospital in an ambulance and operation was performed three hours after the injury. The blood pressure before operation was 110 systolic and 74 diastolic.

The scalp wounds were cleansed and sutured lightly. The wound in the right hip was debrided carefully and left wide open, with four Carrel tubes in place passing to the deepest portions of the wound. The left leg was amputated as low as possible, the wound being left wide open with four Carrel tubes over the wound.

With an entirely clean field the right knee was operated upon. A very careful and complete debridement was performed upon the soft parts, removing all foreign material. The knee joint was thoroughly irrigated with normal saline. The raw portion of the patella where it was devoid of soft parts was painted with alcohol and again irrigated with saline. The capsule was drawn down over the raw surface of the patella to a point where it could be sutured to the torn attachments of the quadriceps muscle on the anterior surface of the patella. The quadriceps tendon was then drawn down and sutured over this first line of sutures. The skin and subcutaneous tissue was left open and a Carrel tube placed in the wound. There were no splints applied.

*Postoperative course.* A special nurse was detailed to see that he carried out active motion of his knee with each irrigation of Dakin's solution. There were three small areas in the knee wound which sloughed, giving a very small but purulent discharge until the Dakin's solution finally dissolved them and they were replaced by granulation tissue. This required about two weeks. The Dakin solution irrigations occurred every two hours, day and night. He was not awakened to carry out the movements but carried them out whenever he was awake. During the first month the motion at the knee was very slight, possibly 20 degrees at most. We were very cautious, inasmuch as the quadriceps tendon was merely held to the patella by chromic catgut sutures. There was a slight accumulation of fluid present in the knee joint during the first week, but at no time were the symptoms such as to require aspiration. He was irrational at times during the first four days. He complained on beginning the knee motions, saying there was "quite a bit of pain" at first, which, however, passed away after five or ten minutes. Two weeks after the injury he could flex his knee to an angle of 150 degrees. The knee wound was entirely healed five weeks after injury. He was in bed two and one-half months, and was up on crutches, using his right leg only, on February 1, 1923. March 15, 1923, a temporary artificial limb was supplied. March 30, 1923, he was discharged from the hospital, walking with a cane. He is now able to flex his right knee to a right angle and

at times slightly beyond a right angle. The right knee is still improving.

Meetings of the society will be held the first Thursday in each month from October to May inclusive at the various hospitals in Minneapolis. The program will consist of morning operative clinics, afternoon diagnostic clinics, and evening didactic sessions, beginning October, 1923. Members of the medical profession are invited to attend these meetings.

DR. A. A. ZIEROLD, Secretary,  
520 La Salle Building, Minneapolis.

## BOOK REVIEWS

### BOOKS RECEIVED FOR REVIEW

**TONSILLECTOMY.** Greenfield Sluder, clinical professor and director of department of Rhinology, Laryngology and Otology, Washington University, School of Medicine, Baltimore. 176 pages. 90 illustrations. St. Louis: C. V. Mosby Co., 1923. Cloth, \$5.00.

**CEREBROSPINAL FLUID.** Abraham Levinson, B.S., M.D., associate in Pediatrics, Northwestern University Medical School. Second edition. 267 pages. Illustrated. St. Louis: C. V. Mosby Co., 1923. Cloth, \$5.00.

**INTERNATIONAL CLINICS.** A quarterly of illustrated clinical lectures and especially prepared articles by leading members of the medical profession throughout the world. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, in collaboration with several others. Volume 2, Series 33. Philadelphia and London: J. B. Lippincott Co., 1923.

**THE HOPE OF THE VARIANT.** By John George Gehring, M.D., Sc.D. Price \$2.00. 252 pages. New York: Chas. Scribner's Sons, 1923.

This book, written by a physician evidently occupying his later years with the care of the nervously and mentally disturbed, seems to deal plainly with certain very pressing problems that now concern a host of thoughtful people. The book appears to be primarily intended for "the general practitioners of medicine," although its arrangement, style and arguments are such that the general reading public should enjoy it and profit by it. The book deals with much of the material that has greatly interested the different "psychological study classes," and therefore should merge well into the reading done by those drawn into the study of that interesting phase of human existence.

The reviewer soon encounters the well known terms, "sub-consciousness," "suggestion," "auto-suggestion," and many other commonly used terms. To begin with, the author takes up the matter in a wholly reverent manner, and in his consideration of sick and unhappy mankind adopts the basic and obvious principle that man cannot be considered apart from "his complete equipment. \* \* \* We shall keep ever in mind \* \* \*, his human soul, which is so intimately interwoven with his destiny and cannot be ignored."

Man in perfect equilibrium is discussed as an individual who has found his environment, his capacity and his happi-

ness in the proper and orderly succession of birth, training and then productivity. He rightly rebels against the obvious tendency to standardize everybody, forgetful of the normal individual variations. This recognition of these physical and mental variations, the great diversity of reaction on the part of conscious and subconscious entities, provide the maelstrom, the hubbub, that comprise our lives. To the subconscious, or in plain ordinary language, our vegetative existence, common to the dog, the cow and all living things, is added our higher cerebration, with its ultimate product, a *conscience*. When our great inheritance of instinct (so closely tied up with our vegetative existence) and our habits (the product of good or bad training) come into conflict with our higher intellectual creations, it is then that all sorts of reactions result, and it is seen that an understanding of man, as a simple mass of clay, is quite impossible.

The body of the book deals much with how to understand, prevent and obviate the undesirable reactions. The man who was Robert Herrick's original for his famous essay, "The Master of the Inn," had the most wholesome way of illustrating each of his concepts with first-hand personal experiences and contacts with actually perturbed folks. In his acknowledgment of the "overflow of the subjective interfering with the objective," the medical reviewer can detect the phase of the "physical self" most implicated in producing the general trend of "psychic depression": it is evidently vagaries of the digestive tube according to the author's own experiences. Nevertheless, he is by no means a faddist, and the best medical judgment of today would no doubt in the main subscribe to his conclusions. He most delicately chides the Fletcherian who would solve all the world's problems by asking man to chew his food instead of his raiment! As to his food choice, he is likewise on firm ground in asserting that man has proven that he can subsist on the greatest variety of food; he is equipped to be omnivorous. Why, therefore, make a big fuss about the type of food chosen? but rather encourage the seeking of that which agrees and gives strength, comfort and vivacity.

He discusses "Suggestion" and Coue together, and gives the French chemist great credit, not for discovery but for the zeal of the enthusiast who has called the crowd to witness that which was perfectly obvious but concealed. He cites many examples, like the well known one of the shell-shocked doughboy who couldn't speak. He landed at the station to be taken up by ambulance to a convalescence hospital. The highly confident ambulance driver bundled him in and tersely stated, "They will have you talking in just two days; they do it to a lot of them." The soldier astonished himself quite as much as the driver by blurting forth in speech at once; if it was to come in two days, why wait!

The author touches a feature that we should all well consider presently: "Many people are taught, but not trained." He would infer that early habits of children as to food choice, bursts of spirit—anger, peevishness—all lay the foundation for those permanent indispositions so aptly described by many as the means by which so many people "enjoy poor health." "Much of life is spent in overcoming the faulty habits originating in childhood." He counsels against even "too much petting" of those who are physically under par, because it is only through resistance and a refusal

to accept bodily infirmity that many of the physically unfit have been able not only to rise above their affliction but themselves as well.

Accepting the "Variant," or the substandard individual, notably of the mental and psychic type, as comprising a fairly large percentage of our population, the author attempts to offer various means for relief. Obsessions (with which so many people of brains and capacity are afflicted) he states are never the result of orderly processes of reasoning, but come from *feeling* alone. Therefore, it is useless to reason with this sort of concept. In like manner, he would aim to displace the various phobias with other habits of "reasonable purpose and desire"; in other words, to simply displace that which is unreasonable, illogical and harmful by that which is purposeful, wholesome and productive.

He pays accurate tribute to the rôle played by "the patient's family": either encouraging the persistence of the malady by undue credulousness, sympathy and concern, or paralyzing the initiative of the afflicted by an attitude of disgust, derision or contempt.

He is not overcritical of his fellow physicians, but, like many other writers, points out the well known failure of many of us to properly evaluate the degree of discomfort that comes to those who are essentially physically sound but psychically badly twisted. He ascribes the growth and success of many of the non-medical healing cults to the lack of interest on the part of the regular medical practitioner or family physician in the plights of those suffering from "emotional restraint," "various types of inhibition," or those plainly muddled up over an agglomeration of fear, apprehension, fatigue and despair—wolves that forage in our mental paddocks. The busy physician can take some comfort from his recital of his experience with a loquacious woman, as recited on page 173: "The writer has often had occasion to marvel over the relief that would come to a patient who has for the first time been permitted wholly to talk himself out." Speaking along this line, note the following: "The lady talked in a manner as though apprehensive lest there might not be time enough given her. During this talk she repeatedly stated that she would need to talk several hours for a number of days in order to explain herself properly." She was given reassurance, and did continue for the better part of three days, at which time she noticed that she had to repeat considerably, and losing interest exhibited great relief, and was willing to accept the physician's verdict!

I would recommend the book as being fair, conservative, accurate and instructive. It should not be too universally applied, like much instruction of this same order. Most physical disorders are accompanied with subjective discomforts and complaints. The individual possessor is unfortunately a poor authority to decide which are which.

E. L. TUOHY, M.D.

**TONSILLECTOMY: BY MEANS OF THE ALVEOLAR EMINENCE OF THE MANDIBLE AND A GUILLOTINE.** Greenfield Sluder, M.D. 176 pages, 90 illustrations. St. Louis C. V. Mosby Co., 1923. Price \$5.00.

This admirable text on tonsillectomy covers the subject in a more comprehensive way than anything heretofore. Well written and profusely illustrated (90 illustrations), it:

gives a thorough working knowledge of the anatomical parts as well as surgical procedures.

Under the title embryology, the blood supply of the tonsil is fully explained. Function of the tonsils is discussed under five different theories, namely: (1) protection, (2) internal secretion, (3) hematopoiesis, (4) elimination, (5) immunity. The author accepts none of these definitely.

Indications for tonsillectomy are given in great detail and are those familiar to men doing this kind of work. Contraindications are stated as (1) hemophilia, (2) status lymphaticus, (3) general conditions, as diabetes, etc.

The author emphasizes preoperative preparation; says morphine should never be given before operation because it abolishes cough reflex; he prefers the complete recumbent position. As to after-treatment—no gargles or applications, morphine in small doses, and tonsil clamp for oozing. Nitrous oxide is given as the anesthetic to be preferred.

In a summary, methods of operating are compared as follows: Sluder technic has the advantage of perfect result, speed, little bleeding, lessened shock, performance by touch alone, little or least trauma and unnecessary destruction, and can be performed with nitrous oxide or local anesthesia.

Great emphasis is laid on the importance of the so-called "alveolar eminence of the mandible," which is a prominent ridge below the molar roots. From the time the instrument is inserted with this eminence as a landmark, the operation is discussed in the very greatest of detail which even the novice would find very easy to grasp.

The volume concludes with a treatise on "Adenoidectomy with Direct Vision" by Dr. Kelly of the Washington University. It is ably presented and of merit. This method certainly would obviate the complications to tubes, septum, etc., which now are of too frequent occurrence.

Dr. Sluder naturally is an enthusiast. His percentage of perfect tonsillectomies seems rather high, and probably is

higher than the majority of operators. In the opinion of the reviewer, the Sluder operation is without a par when speed and lessened trauma are of first consideration, but still cannot *entirely* take the place of dissection and snare, which is a 100 per cent operation in the hands of an able operator.

K. C. WOLD, M.D.

**PRACTICAL LOCAL ANESTHESIA.** Robert Emmett Farr, Minneapolis. 529 pages, 219 illustrations. Philadelphia and New York: Lea & Febiger, 1923. Cloth, \$8.00.

In this volume a division has been made on the subject material into three sections. The first six chapters treat of the choice of an anesthetic, chemical and physiologic problems relating to both general and local anesthesia, equipment and general technique for the production of local anesthesia, and lastly a review of the anatomy of the sensory nervous system.

Section II, of six chapters, gives detailed instructions for the application of local anesthesia to all surgery except that of the abdomen. Abdominal and pelvic anesthesia are described in Chapters 13 to 18, inclusive. Spinal anesthesia is omitted, as the author pleads insufficient experience.

This book, as the title would indicate, has an eminently practical appeal. Complicated maneuvers are conspicuous by their absence and the technique described is simple and workable. It is well bound, clearly printed, and contains an abundance of instructive cuts. Beyond a discussion of local anesthesia, the reader will find a surprising amount of information on the technique of surgery.

A book of sufficient merit that the future should see a demand for further editions.

DONALD K. BACON, M.D.

**PRACTICE FOR SALE**—General practice in south-central Minnesota; modern county seat town in prosperous farming section; average competition; good collections; no real estate; will sell for price of part of equipment. Address B61, care of MINNESOTA MEDICINE.

**WANTED**—Position as assistant to surgeon, clinic or partnership. Recent graduate. Have had three years' continuous hospital-surgical experience. Address B62, care of MINNESOTA MEDICINE.

**WANTED**—A capable internist with a knowledge of fluoroscopy and x-ray interpretation to buy a third interest in a small group practice established four years. You buy only your share of office equipment and modern x-ray outfit at the invoice price of about \$2,500. Will sell only to a high grade man with good references as to ability and integrity. Present incumbent leaves January

first. Location in one of the most progressive North Dakota cities of 5,000 population with modern hospital and other advantages. Present group holds many very desirable appointments. Excellent opportunity to fall into a big practice in internal medicine with a large office and hospital clientele that will yield more than a good living income the first year. Detailed business statement will be furnished on application. Address B-65, care MINNESOTA MEDICINE.

**FOR SALE**—In Southern Minnesota, \$7,000 unopposed practice in good town, 450 population, with large contributing territory. Good office. Will sell equipment for \$1,500. Going into specialty. Address B64, care of MINNESOTA MEDICINE.

**TRAVELER WANTED** for Minnesota. Splendid position for physician. Liberal contract; no books. Address B63, care of MINNESOTA MEDICINE.